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BULLETIN OF DUKE UNIVERSITY

Financial Report



1963-1964

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BULLETINS
OF
DUKE UNIVERSITY

FINANCIAL REPORT

Year Ended June 30, 1964

Duke University

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TABLE OF CONTENTS

	PAGE
Letter of Transmittal	6
Report of Independent Certified Public Accountants	9
Balance Sheet	10
Condensed Statement of Income, Expenditures and Appropriations	14
Schedule A—Endowment Funds	19
Schedule B—Endowed Special Funds	22
Schedule C—Scholarship Funds	30
Schedule D—Student Loan Funds	45
Schedule E—Current Restricted Funds	51
Schedule F—Gifts, Grants and Contracts for Research	80
Schedule G—Grants and Contracts for Training Programs	82
Schedule H—Gifts for the Libraries	82
Schedule I—Gifts for Current Expenses	82
Schedule J—Gifts for Fellowships and Scholarships	83
Schedule K—Gifts for Miscellaneous Purposes	84
Schedule L—Gifts for Professorships	85
Schedule M—Gifts for Plant and Equipment	85
Schedule N—Gifts and Bequests to Permanent Funds	86
Duke University Investments	87
Forms for Bequests	95

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LETTER OF TRANSMITTAL

To the Board of Trustees of Duke University:

We submit for your examination and information the annual financial report of Duke University which shows in some detail the results of the operation for the year ended June 30, 1964.

The figures contained in this report have been verified by our certified public accountants and the certificate of Peat, Marwick, Mitchell & Co. is included as a part of this report.

It will appear from the condensed Statement of Income, Expenditures, and Appropriations that the University, exclusive of the Hospital, sustained a loss from operations of $228,213 for the fiscal year. Duke Hospital operated also at a net loss of $152,131 thus making the deficit for the University as a whole amount to $380,344. This deficit was covered by transferring $248,720 from the Reserve for Faculty Salary Improvement and charging the remainder ($131,624) to the Reserve for Undistributed Income.

The following summary and comparison of Educational and General receipts and expenditures will be of interest.

	1964		1963	
Income	*Amount*	*Per Cent of Total*	*Amount*	*Per Cent of Total*
Endowment income	$ 6,641,937	26%	$ 6,692,868	29%
Gifts and grants:				
Loyalty funds	393,292	2	409,856	2
For research	9,773,325	38	7,688,885	32
For training programs	2,301,148	9	1,754,154	7
For the libraries	19,087	—	27,961	—
For professorships	129,200	—	138,500	1
For current expenses:				
Faculty salary improvement	—	—	750,486	3
Other	488,052	2	491,613	2
Total gifts and grants	13,104,104	51	11,261,455	47
Tuition and fees	6,330,308	25	5,275,027	22
Sundry:				
Other investment income	160,040	—	211,690	1
Other income	1,987,899	8	1,504,071	6
Total sundry	2,147,939	8	1,715,761	7
Transfer from principal of Endowed Special Funds	25,000	—	25,000	—
	28,249,288	110	24,970,111	105
Deduct (add) amounts transferred to (from) restricted fund balances representing excess of current income over current expenditures (excess of expenditures over income)	1,112,944	4	(787,473)	(3)
	27,136,344	106	25,757,584	108
Less appropriations (net) to other income classifications	1,593,086	6	1,956,400	8
Total income	$25,543,258	100%	$23,801,184	100%

Expenditures				
Administration	$ 1,493,418	6%	$ 1,310,442	6%
General operations	695,339	3	632,322	3
Instruction, other than Professorships (including summer sessions)	8,302,374	32	7,870,132	33
Research	9,043,069	34	8,003,297	34
Training programs	2,103,722	8	1,743,793	7
Libraries	1,281,990	5	1,188,965	5
Professorships	138,898	—	110,094	—
Staff benefits	1,279,560	5	1,077,566	5
Transfers to principal of Endowed Special Funds	27,926	—	27,944	—
	24,366,296	93	21,964,555	93
Physical plant	1,742,541	7	1,544,125	7
Total expenditures	$26,108,837	100%	$23,508,680	100%

The Endowment Income shown above includes income from the Duke Endowment in the amount of $3,931,254 for 1964 and $3,961,494 for 1963.

The Endowment Funds of the University are invested in securities in accordance with an investment policy established by the Investment Committee of the Board of Trustees. A list of securities held at June 30, 1964 begins on page 87 of this report. A summary, including both cost and market values, of the types of securities held at June 30, 1964 follows:

Description	*Cost or Amortized Value*	*Quoted Market Value*
Endowed Funds:		
Endowment Funds	$43,309,710	$ 71,336,049
Endowed Special Funds	2,896,718	3,955,000
Scholarship Funds	4,858,847	7,742,940
Student Loan Funds	135,888	233,333
Total Endowed Funds	51,201,163	83,267,322
Funds Functioning as Endowment	2,462,339	2,486,215
Other Funds:		
Current Restricted	5,507,876	6,388,997
Agency	338,475	376,167
	5,846,351	6,765,164
Pooled cash and securities (Current Fund)	9,549,712	9,547,430
	$69,059,565	$102,066,131

The Balance Sheet and the summaries above include only those assets to which title actually vests in Duke University and consequently do not include any portion of the indivisible Corpus of The Duke Endowment, the income from which, subject to the terms of the Trust Indenture, accrues to Duke University as one of the several beneficiaries. Nor do the accounts include the principal funds of trusts independently administered for the benefit of Duke University; such as, the Angier B. Duke Memorial, Inc., Frederic M. Hanes Bequest, the Frederic M. Hanes

Memorial Trust, the Albert Anderson Bequest, the James A. Gray Foundation, and the Mary Alyse Smith Scholarship Fund.

Respectfully submitted,

G. C. HENRICKSEN
Vice President for Business and Finance

S. C. HARWARD
Comptroller

September 30, 1964

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

The Board of Trustees
Duke University:

We have examined the balance sheet of Duke University as of June 30, 1964 and the related condensed statement of income, expenditures and appropriations for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and condensed statement of income, expenditures and appropriations present fairly the financial position of Duke University at June 30, 1964 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year. Also, in our opinion, the accompanying schedules are stated fairly in all material respects when considered in conjunction with the financial statements taken as a whole.

PEAT, MARWICK, MITCHELL & CO.

Greensboro, N. C.
August 17, 1964

BALANCE SHEET
June 30, 1964
ASSETS

CURRENT FUND:		
Pooled cash and securities:		
Cash	$ 2,490,737	
Securities, at cost or amortized value:		
U. S. Government securities	9,493,100	
Short-term notes	50,000	
Interest purchased	6,612	
	9,549,712	
	12,040,449	
Less equity of other funds	10,873,177	
	1,167,272	
Accounts receivable, after deducting $2,478,663, which is a 100% reserve against hospital patients' accounts	531,714	
Inventories, at cost	1,170,061	
Deferred charges	70,350	
		$ 2,939,397
CURRENT RESTRICTED FUNDS:		
Equity in pooled cash and securities	6,381,957	
Notes receivable	9,946	
Accounts receivable	925	
Investments, at cost or amortized value	5,507,876	11,900,704
FUND FUNCTIONING AS ENDOWMENT:		
Equity in pooled cash and securities	1,950,000	
Investments, at cost or amortized value	2,462,339	4,412,339
ENDOWMENT FUNDS:		
Equity in pooled cash and securities	21,426	
Investments, at cost or amortized value	43,309,710	43,331,136
Carried forward		$ 62,583,576

BALANCE SHEET

June 30, 1964

LIABILITIES AND FUND BALANCES

CURRENT FUND:		
Accounts payable and encumbrances:		
Accounts payable	$ 642,670	
Purchase orders and other encumbrances	667,279	
	1,309,949	
Students' deposits	242,579	
Deferred income:		
Loyalty funds (1963-64, expendable for general purposes in 1964-65):		
Duke University	327,844	
Medical School	84,248	
	412,092	
Endowment—The James B. Duke Professorship Fund	74,786	
Development of Graduate School	111,781	
Student advance tuition and fees	242,852	
Miscellaneous	46,831	
	888,342	
Fund balances:		
Reserve for post retirement benefits	71,500	
Reserve for reappropriation for hospital operations (note 8)	280,000	
Other reserves	3,245	
Unappropriated—Reserve for undistributed income, less $353,417 unabsorbed deficit to June 30, 1960 from hospital operations	143,782	
	498,527	$ 2,939,397
CURRENT RESTRICTED FUNDS (Schedule E):		
Purchase orders and other encumbrances	2,153,151	
Balance of funds	9,747,553	11,900,704
FUND FUNCTIONING AS ENDOWMENT:		
Balance of fund		4,412,339
ENDOWMENT FUNDS (note 1) (Schedule A):		
Principal of funds with income designated for general purposes, including net realized gains on investments, $11,587,985		43,331,136
Carried forward		$ 62,583,576

BALANCE SHEET—Continued

Assets—Continued

Brought forward		$ 62,583,576
ENDOWED SPECIAL FUNDS:		
Equity in pooled cash and securities	$ 178,366	
Investments, at cost or amortized value	2,896,718	
		3,075,084
SCHOLARSHIP FUNDS:		
Equity in pooled cash and securities	333,641	
Investments, at cost or amortized value	4,858,847	5,192,488
STUDENT LOAN FUNDS:		
Equity in pooled cash and securities	197,796	
Notes receivable	478,215	
Investments, at cost or amortized value	135,888	811,899
PLANT FUNDS (note 3):		
Equity in pooled cash and securities	1,501,794	
Land, buildings, equipment, library books, including construction in progress	91,544,413	93,046,207
AGENCY FUNDS:		
Equity in pooled cash and securities	308,197	
Notes and accounts receivable including student loan notes, $1,390,397	1,574,171	
Inventories, at lower of cost or market	53,293	
Investments, at cost	338,475	
Other assets	10,665	2,284,801
		$166,994,055

See accompanying notes to financial statements.

BALANCE SHEET—Continued

Liabilities and Fund Balances—Continued

Brought forward		$ 62,583,576
ENDOWED SPECIAL FUNDS (Schedule B):		
Principal of funds with income designated for restricted purposes, including net realized gains on investments, $866,184	$ 2,855,617	
Surplus expendable	219,467	3,075,084
SCHOLARSHIP FUNDS (Schedule C):		
Principal of funds with income designated for scholarship aid, including net realized gains on investments, $1,399,775	4,758,698	
Surplus expendable	433,790	5,192,488
STUDENT LOAN FUNDS (Schedule D):		
Principal of funds with income designated for student loans, including net realized gains on investments, $28,355	58,997	
Principal of funds available for loans, including net realized gains on investments, $40,134	186,285	
	245,282	
Surplus available for loans	566,617	811,899
PLANT FUNDS:		
3-1/2% Serial Bonds (note 6)	2,385,000	
Commitments for construction in progress	313,807	
Investment in plant	88,845,606	
Balance of funds—net (notes 4, 6 and 7)	1,501,794	93,046,207
AGENCY FUNDS:		
Sundry liabilities	88,976	
Balance of funds	2,195,825	2,284,801
		$166,994,055

CONDENSED STATEMENT OF INCOME EXPENDITURES AND APPROPRIATIONS

Fiscal Year Ended June 30, 1964

Income

EDUCATIONAL AND GENERAL:		
Endowment income	$ 6,641,937	
Loyalty funds:		
Duke University	342,936	
Medical School	50,356	
Gifts and grants for research—Schedule F	9,773,325	
Grants for training programs—Schedule G	2,301,148	
Gifts for the libraries—Schedule H	19,087	
Gifts for Professorships—Schedule L	129,200	
Gifts for current expenses—Schedule I	488,052	
Tuition and fees	6,330,308	
Other investment income	160,040	
Other income	1,987,899	
Transfer from principal of Endowed Special Funds	25,000	
	28,249,288	
Deduct amounts transferred to restricted fund balances representing excess of current income over current expenditures	1,112,944	
	27,136,344	
Less appropriations (net) to other income classifications	1,593,086	$ 25,543,258
Related Activities—hospital revenue net of $280,000 appropriated for future hospital operations (note 8)		7,740,807
Net income from auxiliary enterprises (note 2)		495,929
Total current income		33,779,994
NON-EDUCATIONAL:		
Gifts for fellowships and scholarships—Schedule J	833,889	
Gifts for miscellaneous purposes—Schedule K	513,030	
Investment income	342,164	
Other income	722,485	
	2,411,568	
Deduct amounts transferred to restricted fund balances representing excess of current income over current expenditures	134,588	
	2,276,980	
Add appropriations (net) from other income classifications	960,699	3,237,679
Carried forward		$ 37,017,673

CONDENSED STATEMENT OF INCOME, EXPENDITURES AND APPROPRIATIONS

Fiscal Year Ended June 30, 1964

Expenditures

EDUCATIONAL AND GENERAL:		
Administration	$ 1,493,418	
General operations	695,339	
Instruction, other than Professorships	8,119,080	
Research and training programs (note 2)	11,146,791	
Libraries	1,281,990	
Professorships	138,898	
Summer sessions	183,294	
Staff benefits (note 2)	1,279,560	
Transfers to principal of Endowed Special Funds	27,926	
	24,366,296	
Physical plant	1,742,541	$ 26,108,837
RELATED ACTIVITIES:		
Hospital expenditures (note 2)	7,892,938	
Other expenditures—net	158,563	8,051,501
Total current expenditures		34,160,338
NON-EDUCATIONAL:		
Fellowships and scholarships	2,233,443	
Miscellaneous	989,756	
Transfers to principal of funds:		
Endowed Special Funds	12,126	
Scholarship Funds	2,354	3,237,679
Carried forward		$ 37,398,017

CONDENSED STATEMENT OF INCOME, EXPENDITURES AND APPROPRIATIONS—Continued

Income, Continued

Brought forward		$ 37,017,673
LAND, BUILDINGS, AND EQUIPMENT:		
Gifts—Schedule M	$ 6,073,667	
Investment income	66,903	
Received from Fund Functioning as Endowment	200,000	
Received from auxiliary enterprises	280,497	
Other income	273,049	
	6,894,116	
Deduct amounts transferred to restricted fund balances representing excess of current income over current expenditures	1,543,181	
	5,350,935	
Add appropriations from other income classifications of which $345,276 is from Current Fund	632,388	5,983,323
		$ 43,000,996

See accompanying notes to financial statements.

CONDENSED STATEMENT OF INCOME, EXPENDITURES AND APPROPRIATIONS—Continued

Expenditures, Continued

Brought forward		$ 37,398,017
LAND, BUILDINGS, AND EQUIPMENT:		
Capital expenditures	$ 3,639,428	
Maintenance and other expenditures	2,343,895	5,983,323
		43,381,340
Current Fund deficit including $152,131 from hospital operations		380,344
		$ 43,000,996

Current Fund deficit for year ended June 30, 1964	380,344
Less amount transferred from reserve for faculty salary improvement	248,720
Balance charged to reserve for undistributed income	$ 131,624

NOTES TO FINANCIAL STATEMENTS
June 30, 1964

(1) The accounts do not include as endowment that portion of the indivisible Corpus of The Duke Endowment, the income of which accrues to Duke University subject to the terms of a Trust Indenture dated December 11, 1924, whereby Mr. James B. Duke established a trust to be administered for educational and charitable purposes.

(2) Staff benefits included in expenditures during the year were as follows:

Administration, faculty and staff	$1,279,560
Research and training programs	417,572
Related activities	293,329
Auxiliary enterprises	105,262
	$2,095,723

(3) Land, buildings, equipment, and library books are stated in the accompanying balance sheet at amounts shown on the books, which are substantially at cost of original assets acquired. In accordance with generally accepted institutional accounting practices, depreciation on buildings and equipment is not reflected in the accompanying financial statements other than provision for replacement of certain dormitory and other auxiliary service facilities. Further, assets discarded are removed from plant accounts when it is practicable to determine original cost.

(4) Balance of Plant Funds—net, at June 30, 1964, is after deducting deficits of $537,209 which have arisen from expenditures in excess of funds received for several facility projects. These deficits will be recovered in future years from outside gifts, Current Fund appropriations, and transfers from expendable funds.

(5) Investments in the several funds listed in the balance sheet aggregate $69,059,565 at June 30, 1964 which compares with an aggregate quoted market value of $102,066,131 at that date. Of the excess, $33,006,566 of market over cost or amortized value, $28,026,339 is applicable to investments of the Endowment Funds.

(6) The 3½% Serial Bonds which are payable in annual installments of $30,000 with increasing annual amounts to the year 2001 are secured by a first mortgage on an apartment facility (carried at a cost of approximately $2,650,000) for married students and a first lien on and pledge of the net revenues to be derived from the operation of the facility. Further, under the terms of the loan agreement, the University has deposited, with the Trustee, $237,000 principal amount of U. S. Treasury Bonds to secure the payment of principal and interest. The outstanding amount at June 30, 1964 is after deducting a payment of $15,000 to the Trustee in February, 1964.

(7) Open contracts for construction of buildings and equipment amounted to approximately $7,346,000 at June 30, 1964.

(8) Effective July 1, 1963, the Hospital raised its rates to meet anticipated higher operating costs. The full impact of these increased expenses is not expected to be incurred until the year ending June 30, 1966. Accordingly, an appropriation of $280,000 has been made from current year revenue to be used for future hospital operations.

SCHEDULE A—ENDOWMENT FUNDS

	Book Value
William B. Bell Endowment Fund Established 1951 by bequest from William B. Bell; to be added to the general endowment of the University.	$ 44,670.77
Centennial Endowment Fund Gifts from a number of individuals in connection with the Centennial celebration of Duke University; the income to be used annually, in the judgment of the Trustees, for the benefit of the University.	78,139.56
Joseph Cohan Endowment Fund Established 1959 by bequest from Joseph Cohan; to be added to the general endowment of the University.	40,661.99
Angier Buchanan Duke Endowment Fund Established 1923 by bequest of Angier Buchanan Duke, '05; to be added to the general endowment of the University.	536,869.00
B. N. Duke Endowment Fund Established 1913 by gift from Benjamin Newton Duke; to be added to the general endowment of the University.	970,535.45
Doris Duke Endowment Fund Established 1955 by gift from Doris Duke and allocated by the Trustees for permanent endowment.	418,049.24
J. B. Duke Endowment Fund Established 1913 by gift from James Buchanan Duke; to be added to the general endowment of the University.	3,204,822.31
The James B. Duke Professorship Fund Established 1952 by gift from The Duke Endowment; the income to be used for the purpose of attracting and/or developing distinguished or outstanding professors at the University.	2,416,783.08
Sarah P. Duke Bequest to the B. N. Duke Endowment Fund Established 1939 by bequest from Mrs. Sarah Pearson Duke; one-half of the net income to be used for the general purposes of the University; and one-half of the net income to be used for the establishment of the B. N. Duke Scholarships.	1,016,266.08
Washington Duke Endowment Fund Established 1897 by gift from Washington Duke; to be added to the general endowment of the University.	319,145.14
Duke University Endowment Fund Established 1956 from gifts and grants which had been temporarily carried as funds functioning as endowment.	19,644,859.44
C. C. Dula Endowment Fund Established 1927 by gift from Caleb C. Dula; to be added to the general endowment of the University.	432,027.90

Schedule A (Continued)—Endowment Funds

	Book Value
Robert L. Flowers Endowment Fund Established 1952 by bequest from Robert L. Flowers, '04; to be added to the general endowment of the University.	$ 284,236.81
Ford Foundation Endowment Fund Established 1956 by gift from The Ford Foundation; to be used to advance the academic program either by increases in faculty salaries or by meeting other pressing academic needs.	3,400,702.45
Ford Medical School Endowment Fund Established 1956 by gift from The Ford Foundation; the income to be used for current instructional uses of the medical school.	3,114,421.85
General Education Board Endowment Fund Established 1923 by gift from the General Education Board; to be added to the general endowment of the University.	632,436.52
General Endowment Fund Established to accumulate sundry endowment gifts; from various individuals, foundations and corporations.	948,700.08
Graduate School Endowment Fund Established to consolidate the Development of Graduate School Endowments; consisting of gifts by General Education Board, The Duke Endowment, and other Miscellaneous donors in 1950, 1951, and 1952 in connection with the Development Campaign.	3,661,777.49
Elizabeth P. Hanes Endowment Fund Established 1952, being the unexpended portion of gift from Elizabeth P. Hanes, '08, for construction of a Nurses' Home; this residue being added to the general endowment.	513,527.94
Walker P. Inman Endowment Fund Established 1951 by gifts from Walker P. Inman; to be added to the general endowment of the University.	155,250.26
Florence Reynaud McAlister Chair of Medicine and Medical Research Established 1936 by gift from Mrs. Amelie McAlister Upshur; as a memorial to her sister.	429,509.73
David Ovens Endowment Fund Established 1950 by gift from David Ovens; to be added to the general endowment of the University.	110,416.37
W. R. Perkins Endowment Fund Established 1945 by bequest from William R. Perkins; to be added to the general endowment of the University.	318,860.73

Schedule A (Continued)—Endowment Funds

	Book Value
William Neal Reynolds Endowment Fund	
Established 1950 by gift from William N. Reynolds, '86; to be added to the general endowment of the University.	$ 388,097.19
Luther P. Tapp Memorial Endowment Fund	
Established 1951 by gift from Mr. and Mrs. L. B. Jenkins, '10, and supplemented subsequently by additional gifts in memory of her father, Luther P. Tapp; the income to be used to supplement salaries of professors in the general field of the Humanities.	92,002.04
Word H. Wood Endowment Fund	
Established 1963 by bequest from Word H. Wood; to be added to the general endowment of the University.	158,366.27
TOTAL	$43,331,135.69

SCHEDULE B—ENDOWED SPECIAL FUNDS

	Book Value
Alumni Activities Fund Established 1939 by gift of P. Frank Hanes, '11, in connection with the Centennial celebration of Duke University; the income to be used for the support of the activities of the Alumni Office.	$ 8,097.22
Avera Bible Fund Established 1895 by gift of Mrs. L. B. McCullers in memory of her husband, Willis H. Avera; the income to be used for the purchase of books for the Divinity School Library and for the support of the Avera Bible Lectures.	6,126.54
Isaac Erwin Avery Fund Established 1905 from the proceeds of the sale of the publication of "Idle Comments," a collection of the writings of Isaac Erwin Avery, '94; the income to be used for the purchase of books in the field of journalism.	2,370.12
Louis W. Bailey Memorial Fund Established 1958 by gift of A. Purnell Bailey, B.D., '48, in memory of his father, Louis William Bailey; the income to be used for purchasing books for the Divinity School Library.	409.46
John Spencer Bassett Memorial Fund Established by miscellaneous gifts in memory of John Spencer Bassett, '88, formerly Professor in Trinity College; the income to be used for the purchase of books for the Library.	865.15
Robert Spencer Bell Student Aid Fund Established 1942 by James A. Bell, '86, of Charlotte, N. C., in memory of his son, Robert Spencer Bell, and supplemented subsequently by additional gifts; the income to be used in providing annually a prize for one or more students evidencing the greatest improvement in his college work during the year.	50,072.08
Bequest Program Fund Established 1963 to accumulate unrestricted gifts from bequests.	3,638.07
Germain Bernard Fund Established 1959 by gift from B. C. Remedy Company and transferred in 1961 from Current Restricted Fund; the income to be used by the Duke University Medical School for scholarships, loans or research and if not used for these purposes, to be paid to the Duke University Medical Support fund as a part of the Loyalty Fund.	4,551.70
Mary Duke Biddle Library Fund Established 1951 by gift from Mary Duke Biddle, '07, and supplemented subsequently by additional gifts; the income to be used to maintain and operate the library of Duke University.	574,716.32

Schedule B (Continued)—Endowed Special Funds

	Book Value
Edgar S. Bowling Memorial Fund Established 1955, by gift from Mrs. Edgar S. Bowling; the income to be transferred annually to the Duke University Loyalty Fund.	$ 3,640.94
Joseph G. Brown Book Fund Established 1921 by gifts of various individuals in honor of Joseph G. Brown, '75, chairman of the Board of Trustees 1917-27; the income to be used for the purchase of books for the Library.	10,481.71
Christian Education Fund Miscellaneous contributions over a period of many years; to be used for various purposes designated by the donors.	9,906.05
Clark Classical Prize Fund Established 1956 by bequest from David Taggart Clark; the income to be used for the award of an annual prize for Greek or Latin declaration or recitation.	322.58
Class of 1909 Fund Established by members of the Class of 1909; the income to be used for the purchase of books for the General Library.	2,286.25
Mary Alice Cook Memorial Fund Established 1956 by gift from Franklin H. Cook, '36, in memory of Mary Alice Rhodes Cook, '36; the income to be transferred annually to the Duke University Loyalty Fund.	757.11
C. T. Council Fund Established 1959 by a gift from the B. C. Remedy Company and transferred from Current Restricted Fund in 1961; the income to be used by the Duke University Medical School for scholarships, loans or research, and if not used for these purposes, to be paid to the Duke University Medical Support Fund as a part of the Loyalty Fund.	4,234.50
The Harvey B. Craven Fund Established May 9, 1960 by gift of Harvey B. Craven, '96; the income to be transferred annually to the Duke University Loyalty Fund.	4,475.94
Crowell Science Lecture Fund Established 1921 by contributions from various individuals; the income to be used for annual lectures on scientific subjects.	4,129.81
Julia Dale Memorial Fund Contributions by friends and relatives in memory of Miss Julia Dale; the income to be used to provide annually for the Julia Dale Prize in Mathematics.	2,653.07

Schedule B (Continued)—Endowed Special Funds

	Book Value
Discretionary Fund of the Dean of the Chapel Established 1956 by gift from Brewster, '32, and Edith Snow, '32; for special activities and services in connection with the work of the Dean of the Chapel.	$ 53,283.00
Duke Memorial Chapel Maintenance Fund Established 1930 by James A. Thomas; the proceeds to be used toward the maintenance of the Duke Memorial Chapel.	4,939.47
Duke Monument Fund Established to provide for the perpetual maintenance of the statue of Washington Duke.	3,881.99
Duke Pi Tau Sigma Award Fund Established 1956 by gift from The Duke Pi Iota Chapter of Pi Tau Sigma; the income to be used for an annual award to the mechanical engineering senior student who has presented the most outstanding paper in class work or in professional society competition.	6,233.07
Eason Presbyterian Student Fund Established 1953 by gift from W. W. Eason; the income to be available for a Presbyterian ministerial student.	256.27
The Frank L. Engel Memorial Fund Established 1963 by various contributions through the Duke University Medical Center; the income to be used for an award to an outstanding medical undergraduate at Duke University to participate in the research and clinical activities of the Division of Endocrinology.	2,592.31
Anne Flexner Memorial Fund Established October, 1947 by Dr. Morris Flexner and Mrs. Marion W. Flexner, in memory of their daughter, Anne Flexner, '45; the income to be used for an annual award to the student who does the most outstanding piece of creative writing.	3,949.96
George Washington Flowers Memorial Fund Established 1941 by bequest of William W. Flowers, '94, in memory of his father, George Washington Flowers, and supplemented in 1952 by bequest of Robert L. Flowers, '04; the income to be used for the purchase of manuscripts, books and other printed or photographed materials dealing with the life and thought of the Southern states of the United States of America.	430,985.62
John McTyeire Flowers Lecture Fund Established 1915 by gift of B. N. Duke in memory of John McTyeire Flowers, '00; the income to be used for lectures dealing with the subject of Christian citizenship.	24,643.96

Schedule B (Continued)—Endowed Special Funds

	Book Value
The Forestry Alumni Association Fund Established 1962 by gift from Duke University Forestry Alumni Association; the income to be used to purchase books for the F. X. Schumacher Statistical Library or for other purposes of the School of Forestry, as directed by the Forestry Alumni Association.	$ 569.84
William F. Franck Memorial Fund Established 1958 by gift from William F. Franck, Jr., '39, supplemented by additional gifts; the income to be used for cardiac research, or medical school scholarships, and if not used for these purposes, to be paid to the Loyalty Fund.	7,636.08
Jesse T. and Lovie Brooks Frizzelle Memorial Fund Established 1954 by gift from Mark T. Frizzelle, '03, and supplemented by additional gifts from J. Paul Frizzelle, Sr., '04, Jasper B. Frizzelle, '09, and John L. Frizzelle, Sr., '12; the income to be transferred annually to the Duke University Loyalty Fund.	22,849.31
Gibbons Mental Health Fund Established 1963 by bequest from John P. Gibbons; to be used to establish a J. P. Gibbons Professorship of Psychiatry.	200,619.41
William Francis Gill Memorial Fund Established 1918 by gifts of several individuals, in memory of William Francis Gill, '94, for many years Professor of Latin at Trinity College; the income to be used for a collection of books in the General Library in the field of Latin.	1,765.73
F. M. Hanes Bequest to Department of Medicine Established 1951 by bequest from F. M. Hanes; comprised of 20% of the proceeds from the Trust; the income to be used for the promotion of the highest standards of medical teaching and for medical research.	160,286.01
F. M. Hanes Bequest to School of Medicine Established 1951 by bequest from F. M. Hanes; comprised of 20% of the proceeds from the Trust; the income to be used for the promotion of the highest standards of medical training and for medical research.	160,286.01
Frederic M. Hanes Memorial Trust Fund Established 1959 by bequest from Mrs. Elizabeth P. Hanes; comprised of 20% of the proceeds from the Trust; the income to be used for the promotion of medical teaching and medical research.	5,337.09
P. Huber Hanes Fund Established 1939 by gift of P. Huber Hanes, '00; the income to be used as follows: three-fifths for the support of the P. Huber Hanes Scholarships; one-fifth to the P. Huber Hanes, Jr. Scholarship; and one-fifth to the Duke University Press.	120,298.47

Schedule B (Continued)—Endowed Special Funds

	Book Value
Charles W. Hargitt Research Fellowship in Zoology Fund Established 1939 by Dr. George T. Hargitt; the proceeds to be used for establishing a research fellowship in Zoology, to be named in memory of Charles W. Hargitt.	$ 154,862.48
Winfred Quinton Holton Memorial Fund Established 1922 by gifts of Holland Holton, '07, and Mrs. Lela Young Holton, '07, in memory of their son, Winfred Quinton Holton; the income to be used to provide a prize for investigative work in primary education.	4,104.99
Hospital Chaplains' Fund for Compassion Established 1963 by various contributors, in memory of Dorothy Thigpen Elliot; to be used for pastoral care of patients and members of their family, compassionate expense items and special events and services in the Hospital Chapel.	3,633.24
Walker P. Inman Memorial Grant Established July 2, 1959 by bequest from Georgia Inman; the income to be used for furthering and promoting research into the subject of heart disease and other heart ailments.	224,994.83
The Jones Chair of Engineering Fund Established 1951 by gifts from J. A. Jones Construction Company, Mr. Edwin L. Jones, '12, Mrs. Annabel Lambeth Jones, '12, Mr. Edwin L. Jones, Jr., '48, and Lucille Finch Jones, and supplemented by other gifts; the income to be used for the benefit of the College of Engineering as salaries, a professorship, scholarships or research.	209,134.95
Henry Harrison Jordan Memorial Foundation Established 1947 by gifts from Mrs. George Way, B. Everett Jordan, '18, H. W. Jordan, Charles E. Jordan, '23, Mrs. H. C. Sprinkle, Jr., '24, and Frank B. Jordan, '27, children of Reverend Henry Harrison Jordan, of the residue of the estate of their father, supplemented by additional gifts; the income to be used for the support of the Ministers' Loan Library of the Duke Divinity School.	56,345.07
The William Arthur Kale, Jr., Memorial Fund Established 1964 by gift from W. A. Kale, '15, and Ruth Rogers Kale, in memory of William Arthur Kale, Jr., '58; the income to be used annually to purchase books and other materials in the areas of fine arts and religious musicology in the library of the Divinity School of Duke University.	3,043.96
Library Endowment Fund Established 1939 by contributions from a number of individuals in connection with the Centennial celebration of Duke University; the income to be used for the General Library of Duke University.	5,144.79

Schedule B (Continued)—Endowed Special Funds

	Book Value
Nellie McClees Fund	
Established 1963 by gift from Nellie McClees, '02; the income to be transferred annually to the Duke University Loyalty Fund.	$ 551.21
McDougall Reserve Fund	
Established 1957 by accumulated income in William McDougall Research Fund; to serve as a Reserve Fund for the benefit of the Duke University Parapsychology Laboratory.	88,175.56
Medical School Research Fund	
Established 1939 by contributions from a number of individuals in connection with the Centennial celebration of Duke University; the income to be used for medical research.	12,924.63
Methodist College Advance Fund	
Established by contributions from the Western North Carolina Conference and the North Carolina Conference of the Methodist Church; the income to be used for scholarships for young men and women preparing for full time service in the work of religious education, and for a program of educational service to ministers already in the field. This plan would permit the use of the funds for special conferences, expansion of the Ministers' Loan Library, short-term winter courses, and other services, particularly to rural churches.	52,220.25
Albert Milmow Prize in Electrical Engineering	
Established 1935 by gift of Albert Milmow; the income to be used in providing annually a prize to that student from North or South Carolina graduating in the Department of Electrical Engineering who, in the opinion of the faculty of that department, has made the most progress in electrical engineering during his last year in college. This prize consists of a certificate of award and one year's dues in the American Institute of Electrical Engineers.	553.77
J. M. Ormond Fund for the Training of Ministers for the Rural Church	
Established December 11, 1948 by gifts through the Methodist College Advance and supplemented subsequently by additional gifts; the income to be used to do research work in the rural church field of the North Carolina Conference of the Methodist Church of the Southeastern Conference.	180,700.12
Ormond Memorial Fund	
Established 1924 by Dr. J. M. Ormond, '02, and Mrs. Ormond, in memory of his mother and father, Mr. and Mrs. J. J. Ormond; the income to be used for the purchase of a collection of books on the rural church for the Library of the Divinity School at Duke University.	3,038.94

Schedule B (Continued)—Endowed Special Funds

	Book Value
Publications Sinking Fund Established by the Publications Board of Duke University to serve as a reserve for the publications operated under its direction.	$ 61,061.03
The James B. Rast Memorial Award Fund Established December, 1957 by Mr. and Mrs. W. B. Rast, in memory of their son, James Brailsford Rast, '58; the income to be used for an annual award to the student who demonstrates the greatest achievement in the study of Comparative Anatomy.	2,914.50
The Bob Seibels, Jr., M.D. Memorial Laboratory Fund Established 1956 by bequest from Robert E. Seibels, M.D. for the purpose of establishing a Laboratory of Gynecological and Obstetrical Research at Duke University.	32,992.82
William Senhauser Memorial Fund Established 1947 by gift of Mrs. Thomas E. Raymond in memory of her son. An award is made annually to the sophomore or junior who has made the greatest contribution through participation and leadership in intramural sports.	3,036.40
The George Sherrerd, III Memorial Award in Electrical Engineering Established 1958 by gift from Mr. and Mrs. S. Donald Sherrerd, in memory of their son, George Sherrerd, III, '55; the income to be used for an annual award to the senior in Electrical Engineering who has attained the highest level of scholastic achievement in all subjects and simultaneously has rendered significant service to the College of Engineering and the University at large.	7,746.55
The Hersey E. and Bessie Spence Chair in Christian Education Established 1963 by bequest from Hersey E., '07, and Bessie Spence, '06; the income to be used to establish a Chair in Christian Education.	32,815.54
The Ettie Stettheimer Memorial Heart Research Fund Established 1957 by bequest of Ettie Stettheimer; the income to be used for research in the cause, treatment and prevention of heart disease.	14,628.11
Francis Huntington Swett Memorial Award Fund Established 1951 by gift from Dr. George J. Baylin, '36; the income to provide an annual award to the most valuable basketball player.	1,488.69
Hilda Howes Thomas Fund Established 1956 by gift from J. M. Thomas; the income to be used by the Music Department of Duke University to subsidize projects stimulating interest in the fine arts.	5,107.14

Schedule B (Continued)—Endowed Special Funds

	Book Value
William P. Tudor Fund	
Established 1956 by gift from William P. Tudor, '56; the income to be transferred annually, one-half to the General University Scholarship Fund and one-half to the Duke University Loyalty Fund.	$ 954.28
Gratton Williams Fund	
Established 1920 by bequest of Gratton Williams; the income to be used for the general purposes of Duke University, particularly for the development of the Library.	2,841.10
Luther K. Williams Fund	
Established 1961 by gift of Luther K. Williams, '36; the income to be transferred annually to the Duke University Loyalty Fund.	964.71
James J. Wolfe Memorial Fund	
Established 1921 by his friends and former students in memory of Dr. James J. Wolfe, Professor of Biology at Trinity College from 1904 until his death in June, 1920; the income to be used to purchase periodicals relating to biology.	2,942.30
Lizzie Taylor Wrenn Foundation Fund	
Established 1921 by gift from Mrs. May Wrenn Morgan, '08, and her husband, John Allen Morgan, '06, in memory of Mrs. Morgan's sister, Lizzie Taylor Wrenn, '12; the income to be used for purchase of books for the Library of Duke University.	2,013.65
TOTAL	$3,075,083.83

NOTE

Certain Endowed Special Funds established for the benefit of Duke University have independent trustees. The following is based on the report of the Trustee:

Frederic M. Hanes Bequest

Wachovia Bank and Trust Company, Winston-Salem, North Carolina, Trustee of trust created under Will of Frederic M. Hanes for the benefit of the Unit of Duke University known as the Duke University Medical School and Hospital.

Total Book Value at the close of the Trust Year on May 8, 1964. $3,116,658.34

Frederic M. Hanes Memorial Trust

Wachovia Bank and Trust Company, Winston-Salem, N. C. Trustee under agreement with Elizabeth P. Hanes for Frederic M. Hanes Memorial Trust of Duke University Medical School.

Total Book Value at the close of the Trust Year on June 1, 1964. $ 90,542.55

SCHEDULE C—SCHOLARSHIP FUNDS

	Book Value
Fred Soule Aldridge—Durham County Alumni Scholarship Fund	
Established December, 1947 by gift of Fred S. Aldridge, '96, and Mrs. Aldridge and includes subsequent contributions from the Durham County Alumni: the income to be used for scholarship aid, preference to be given to young men from Durham County.	$ 6,824.58
George G. Allen Scholarship Fund	
Established July, 1947 by gift of George G. Allen; the income to be used for scholarship aid to deserving boys and girls from Warren County, N. C., and, under certain conditions, for other worthy students.	143,784.59
Alumnae Scholarship Fund	
Established May, 1940 by the Alumnae Association, in connection with the celebration of the Centennial of Duke University; the income to be used for scholarship aid to young women students of the Woman's College.	4,987.80
Alumni Memorial Scholarship Fund	
Established December, 1943 by several donors, in memory of alumni of Duke University who lost their lives during World War II; the income to be used for scholarship aid to worthy students.	5,190.83
Atlanta Alumni Scholarship Fund	
Established May, 1941 by gifts of members of the Alumni Association of Atlanta, Ga.; the income to be used for scholarship aid to worthy students.	6,911.42
Mary Reynolds Babcock Divinity School Scholarship Fund	
Established 1962 by gift from the Mary Reynolds Babcock Foundation; to be used for scholarship aid to Negro students in the Divinity School.	700.00
Alice M. Baldwin Scholarship Fund	
Established June, 1945 and supplemented from time to time by gifts from students and alumnae in honor of Alice M. Baldwin, Dean of the Woman's College, 1923-47; supplemented by a gift from the Class of 1951 of the Woman's College in memory of Bernice Lipscomb, '51, and Betsy Thorup, '51; and supplemented in 1958 by a gift from the Class of 1942 of the Woman's College; to be used for scholarship aid to undergraduate students in the Woman's College.	73,892.10
Banks-Bradshaw Scholarship Fund	
Established 1913 by gift of W. L. Banks and Mike Bradshaw, '78; the income to be used for scholarship aid to worthy students.	2,849.35

Schedule C (Continued)—Scholarship Funds

	Book Value
Evelyn Barnes Memorial Scholarship Fund Established in 1953 in memory of Evelyn Barnes; the income to be used for scholarship aid to worthy students in the Woman's College.	$ 11,186.85
Herbert J. Bass Scholarship Fund Established 1900 by gift of Mr. and Mrs. Herbert J. Bass of Durham, N. C., in memory of their son, Herbert J. Bass, Jr.; the income to be used for scholarship aid to worthy students.	3,296.90
Mary Duke Biddle Foundation Scholarship Fund Established 1963 by gift from the Mary Duke Biddle Foundation; to be used for scholarships in the training of operating room nurses.	2,000.00
William M. Blackburn Scholarship Fund Established 1962 by various contributions; the income to be used for scholarship aid to worthy students.	5,130.27
Edgar S. Bowling Scholarship Fund Established 1928 by gift of Edgar S. Bowling, '99, in memory of his sister, Mrs. Maye Bowling Bennett, '12; the income to be used for scholarship aid, preference to be given to boys and girls from Durham and adjoining counties.	60,045.01
Franklin Brown Family Scholarship Fund Established 1954 by gift from Mr. W. Franklin Brown, '37, and Mrs. Louise Jones Brown, '38; the income to be used for scholarship aid to worthy undergraduate students.	17,607.07
Elizabeth Crowell Carnes Foundation Scholarship Fund Established January, 1948 by bequest of Elizabeth Crowell Carnes, in memory of her parents, Jonas William Crowell and Virginia Vick Crowell; the income to be used for scholarship aid for young men and women of Duke University.	8,239.16
Centennial Scholarship Fund Established 1939 by gifts from several donors in connection with the Centennial celebration of Duke University; the income to be used for scholarship aid to worthy students.	2,780.63
Christian Education Scholarship Fund Established by various contributions designated for scholarships in the Christian Education Movement, and includes contributions from Julian S. Carr, Mrs. Annie A. Foushee, C. T. Johnson, H. E. Myers, the Pegram Family, W. P. Suggs, E. T. White, Mr. and Mrs. J. C. Braswell and Mrs. R. C. Bruton, in memory of Alexander Walker, the alumni of Harnett County, and others; the income to be used for scholarship aid to worthy students.	11,725.44

Schedule C (Continued)—Scholarship Funds

	Book Value
Class of 1906 Scholarship Fund Established July, 1937 by gifts from several members of the Class of 1906; the income to be used for scholarship aid to worthy students.	$ 1,711.01
Class of 1910 Scholarship Fund Established June 5, 1960 by several members of the Class of 1910; the income to be used for scholarship aid to worthy students.	904.56
Class of 1912 Scholarship Fund Established by gifts from several members of the Class of 1912; the income to be used for scholarship aid to worthy students.	1,110.39
Class of 1914 Scholarship Fund Established December, 1938 during the Centennial celebration of Duke University by various members of the Class; the income to be used for scholarship aid to worthy students, preference to be shown to descendants of the members of the Class of 1914.	5,416.92
Class of 1917 Scholarship Fund Established August, 1952 by bequest of the Reverend R. Ernest Atkinson, '17; the income to be used for scholarship aid to needy young Methodist ministers while studying at Duke University.	526.32
Class of 1918 Scholarship Fund Established by gifts from several members of the Class of 1918; the income to be used for scholarship aid to worthy students.	659.44
The Cleland Scholarship Fund Established 1963 by gift of James T. and Alice Mead Cleland; the income to be used for scholarship aid to a designated senior Divinity student.	9,605.93
E. M. Cole Foundation Fund Established 1920 by E. M. Cole, Charlotte, N. C.; the income to be used for scholarships for the benefit of students preparing for the ministry.	32,319.35
Robert B. Cox Scholarship Fund Established 1949 by gift of Robert L. Wolf, '50, and supplemented from time to time by other gifts; the income to be used for scholarship aid for undergraduate men.	8,782.93
Will L. Cuninggim Scholarship Fund Established 1934 by bequest of Mrs. W. L. Cuninggim, and supplemented by bequest of Mrs. Albert Bourne, in memory of Reverend Will L. Cuninggim, '77; the income to be used for scholarship aid, preference being given to graduates of the Methodist Orphanage, Raleigh, N. C.	17,403.79

Schedule C (Continued)—Scholarship Funds

	Book Value
Rose M. Davis Scholarship Fund Established 1941 by Dr. Rose M. Davis, '16; the income to be used for scholarship aid.	$ 586.45
Divinity School Foreign Students Scholarship Fund Established 1955 by contributions from various church agencies; to be used currently for scholarship aid to designated foreign students.	84.94
Divinity School Miscellaneous Scholarship Fund Contributions by various churches and individuals for use currently for scholarship aid to designated individuals.	38,162.18
Jere R. Downing Scholarship Fund Established 1936 by Mrs. Alice M. Downing and her son, J. Robert Downing, '35, as a memorial to their husband and father, Jere R. Downing of Kennebunk, Me.; the income to be used for scholarship aid, preference to be given to students from New England.	2,440.09
B. N. Duke Scholarship Fund Established 1939 by bequest of Mrs. Sarah P. Duke in memory of her husband, Benjamin N. Duke; comprised of one-half of the income earned by the bequest of Sarah P. Duke to the B. N. Duke Endowment Fund; to be used for scholarship aid to worthy and needy students of Duke University.	28,220.44
James B. Duke 100th Anniversary Fund Established in 1956 by gift from The Duke Endowment, in recognition and commemoration of the one hundredth anniversary of the birth of James B. Duke; for the purpose of attracting and/or developing outstanding scholars in and through the Graduate School of Arts and Sciences at Duke University.	1,823,152.66
Duke University Sundry Scholarship Fund Gifts by miscellaneous donors for current use as scholarships.	15,588.27
N. Edward Edgerton Scholarship in Religion Fund Established May, 1940 by gift of N. Edward Edgerton, '21, of Raleigh, N. C.; to be used only for scholarship aid to candidates for the B.D. Degree in the Divinity School of Duke University.	13,097.34
N. E. Edgerton Scholarship Fund Established in January, 1953 by N. E. Edgerton, '21, through the Duke University Development Campaign; the income to be used for scholarship aid to worthy students, preference to be given to students from Wake County, North Carolina.	18,780.64

Schedule C (Continued)—Scholarship Funds

	Book Value
ENGINEERING SCHOLARSHIP FUND Established by gifts of various persons; to be used for scholarship aid to engineering students.	$ 420.40
WILLIAM P. FEW MEMORIAL SCHOLARSHIP FUND Established 1942 by gifts from various persons and supplemented from time to time by other gifts; to be used for scholarship aid to worthy students.	10,053.36
ARTHUR ELLIS FLOWERS SCHOLARSHIP FUND Established 1901 by Col. and Mrs. George W. Flowers, in memory of their son, Arthur Ellis Flowers; the income to be used for scholarship aid to worthy students.	2,197.78
FRED FLOWERS SCHOLARSHIP FUND Established 1961 by bequest of Mr. Fred Flowers, '08; the income to be used for scholarship aid for worthy students.	86,316.85
GEORGE W. FLOWERS SCHOLARSHIP FUND Established June, 1927 by Claude M. Flowers, '09, in memory of his father, Col. Geo. W. Flowers, for many years a Trustee of Trinity College; the income to be used for scholarship aid to needy and worthy students.	10,987.93
R. L. FLOWERS TRUST SCHOLARSHIP FUND Established 1948 by bequest of Lily Parrish Flowers; the income to be used for scholarship aid for worthy students.	119,558.99
FORESTRY SCHOOL SCHOLARSHIP FUND Established 1961 by gift from the Koppers Foundation; to be used for scholarship aid to students in the School of Forestry.	1,600.00
SARA CLARKSON FOWLER SCHOLARSHIP FUND Established 1963 by gift from Henry B. Fowler, in memory of Sara Clarkson Fowler; the income to be used for scholarship aid to worthy students.	550.66
GENERAL UNIVERSITY SCHOLARSHIP FUND Miscellaneous gifts from numerous persons; to be used currently for scholarship aid to worthy students.	512.84
OTTIS GREEN FOUNDATION SCHOLARSHIP FUND Established 1951 by gift from Ottis Green, '97, and supplemented from time to time by other gifts; the income to be used to provide scholarships and fellowships for advanced study in the Graduate School of Duke University.	60,605.03
GUILFORD COUNTY SCHOLARSHIP FUND Established 1941 by miscellaneous gifts of several persons; the income to be used for scholarship aid to worthy students.	243.92

Schedule C (Continued)—Scholarship Funds

	Book Value
A. H. Gwyn Scholarship Fund Established May, 1951 by Judge A. H. Gwyn, '18; the income to be used for scholarship aid to worthy students.	$ 2,447.32
E. Bayard Halsted Scholarship in Medicine Fund Established 1961 by bequest of Mr. E. Bayard Halsted; the income to be used to enable a graduate of the Duke Medical School to pursue advanced studies in some branch of Medical Science.	29,632.87
E. Bayard Halsted Scholarships in Science, History and Journalism Fund Established 1961 by bequest of Mr. E. Bayard Halsted; the income to be used to enable a graduate of Duke University to pursue advanced studies in some branch of Science, History or Journalism.	86,464.79
P. Huber Hanes Scholarship Fund Established 1939, consisting of two-fifths of the income accruing annually to the P. Huber Hanes Fund; to be used for scholarship aid; two scholarships to members of the families of alumni; and two general scholarships.	6,083.79
P. Huber Hanes, Jr. Scholarship Fund Established 1939, consisting of one-fifth of the income accruing annually to the P. Huber Hanes Fund; to be used for two scholarships for junior or senior students majoring in Business Administration.	2,572.36
P. Huber Hanes Divinity School Scholarship Fund Established 1939, consisting of one-fifth of the income accruing annually to the P. Huber Hanes Fund; to be used for one scholarship in the Divinity School.	1,560.46
J. Welch Harriss Scholarship Fund Established May 23, 1950 by gift of J. Welch Harriss, '27, and supplemented subsequently by additional gifts; the income to be used for scholarships to deserving young men from High Point, N. C., entering the Freshman Class.	52,720.15
B. D. Heath Scholarship Fund Established 1903 by B. D. Heath; to be used for scholarship aid to worthy students from Union County, N. C.	6,015.30
High Point Scholarship Fund Established by gifts of members of the High Point Alumni Association in connection with the celebration of the Centennial of Duke University; the income to be used for scholarship aid for students who are graduates of the High Point, N. C., High School.	12,294.64

Schedule C (Continued)—Scholarship Funds

	Book Value
Holcomb Scholarship Fund Established 1956 by gift from Dent Z. and Helen Holcomb; income to be used for scholarship aid to worthy students.	$ 12,089.24
Hungarian Students Scholarship Fund Established 1957 by gifts from students of Duke University; to be used for scholarship aid for Hungarian Refugee students.	60.00
George M. Ivey Scholarship Fund Established December 8, 1948 by gift of George M. Ivey, '20; the income to be used for scholarship aid for deserving students in the Divinity School.	22,946.44
William Patterson Johnston Scholarship Fund Established 1964 by gift from Mr. Kenneth Taylor, '51, other employees of Old Dominion Candies, Incorporated, and supplemented by an additional gift from Mrs. William Patterson Johnston; the income to be used for scholarship aid to worthy students.	1,501.25
Hunter Jones Scholarship Fund Established December, 1947 by gift of Hunter Jones, '19. Durham, N. C.; the income therefrom to be used for scholarship aid to worthy students.	7,862.48
Henry Harrison Jordan Memorial Scholarship Fund Established December, 1938 by gifts from Mrs. George Way, B. Everett Jordan, '18, H. W. Jordan, Charles E. Jordan, '23, Mrs. H. C. Sprinkle, Jr., '24, and Frank B. Jordan, '27, in memory of their father, Reverend Henry Harrison Jordan, a member of the Western North Carolina Conference, and supplemented subsequently by additional gifts; the income to be used for scholarship aid to worthy students.	38,146.98
J. M. Judd Scholarship Fund Established 1922 by Dr. J. M. Judd, '95, of Varina, N. C., with directions that the earnings be allowed to accumulate until such time as they are sufficient to provide a four-year tuition scholarship.	4,596.28
Gurney Harriss Kearns Foundation for Graduate Study in Religion Fund Established 1935 by gifts of Mr. and Mrs. Gurney Harriss Kearns, '97, High Point, N. C., supplemented by Amos R. Kearns, '27, and Charles L. Kearns, '32, and Katherine Kearns Cheek; the income to be used to promote advanced graduate study and research in religion primarily through the award of fellowships, but also to secure visiting lecturers and seminar leaders, and to award grants-in-aid to publish the more significant fruits of scholarly research in religion.	213,715.05

Schedule C (Continued)—Scholarship Funds

	Book Value
W. K. Kellogg Foundation Scholarship for Technicians Fund Established by contribution from the W. K. Kellogg Foundation; the entire sum to be used currently for scholarship aid to students preparing as medical technicians.	$ 1,750.00
Lewis Clarence Kerner Scholarship in Religion Fund Established in May, 1959 by gift of Mrs. Beatrice Kerner Reavis in memory of her brother, Lewis Clarence Kerner; the income to be used for scholarship aid to worthy students of the Divinity School.	25,253.03
Frank S. Lambeth Scholarship Fund Established 1930 by bequest of Col. Frank S. Lambeth, '80; the income to be used for scholarship aid to worthy students of Duke University.	2,223.98
Laurinburg Christian Education Scholarship Fund Established December 11, 1948 by gift through the Methodist College Advance Fund; the income to be used for scholarship aid for worthy students of the Divinity School.	10,674.64
Law School Scholarship Fund Established 1950 by University appropriation and supplemented annually to provide scholarship aid to deserving students in the School of Law.	5,134.80
William S. Lee Memorial Scholarship Fund Established 1957 by gift from Mrs. W. S. Lee in memory of her late husband; the income to be used for scholarship aid for undergraduates in the Woman's College at Duke University.	36,026.43
William A. Leggett Scholarship Fund Established in 1961 by gift of Leggett Memorial Fund; the income to be used for Nursing School Scholarships. If not used for this purpose, income to be transferred anually to the Duke University Loyalty Fund.	1,784.60
D. M. Litaker Scholarship Fund Established 1946 by gift of Charles H. Litaker, '28, in memory of his father, Dr. D. M. Litaker, '90, who for 47 years was an active minister in the Methodist Church, and supplemented subsequently by additional gifts; the income and, under certain conditions, a part of the corpus of the fund to be used for scholarship aid for undergraduate students, natives of the territory now embraced by the Western North Carolina Conference who are preparing for the ministry.	61,393.74

Schedule C (Continued)—Scholarship Funds

	Book Value
Mary Elizabeth Duke Lyon Scholarship Fund Established 1942 by Mrs. Mary Washington Stagg in memory of her mother, Mary Elizabeth Duke Lyon; the income to be used for scholarship aid for worthy students.	$ 11,755.15
The McAlister Scholarship Fund Established December, 1935 by Mrs. Amelie McAlister Upshur in memory of her mother, Armantine Reynaud McAlister, and father, William Henry McAlister; the income to be used annually for a scholarship for one boy and one girl from each of the three states of North Carolina, South Carolina and Louisiana.	236,437.35
J. H. McCracken Memorial Scholarship Fund Established 1947 by Dr. J. H. McCracken, '22, and contributions from members of the First Methodist Church of Henderson, N. C., in memory of Reverend J. H. McCracken, '92, for many years a member of the North Carolina Conference; income to be used for scholarship aid.	10,724.62
T. W. McCracken Scholarship Fund Established 1945 by Thomas W. McCracken, '15; the income to be used for scholarship aid for worthy students.	11,511.88
The O. G. B. McMullan Scholarship Fund Established 1913 by gift of O. G. B. McMullan of Elizabeth City, N. C.; the income to be used for scholarship aid for worthy students, preference to be given to residents of Perquimans and Pasquotank Counties, N. C.	3,165.01
The Louise and C. K. Massey Scholarship Fund Established 1953 by gift from C. Knox Massey and supplemented subsequently by additional gifts; to be used for scholarship aid to worthy students.	5,637.81
R. A. Mayer Scholarship Fund Established 1939, in connection with the Centennial celebration of Duke University, by gift of R. A. Mayer, '96, in memory of his father, Minor C. Mayer, and mother, Sarah R. Mayer, and supplemented subsequently by additional gifts; the income to be used for scholarship aid for worthy students, preference to be given to students from Mecklenburg County, N. C.	26,723.05
Medical School Scholarship Fund Established 1961 by gift from the Mary Duke Biddle Foundation; and supplemented subsequently by additional gifts to be used for scholarship aid to medical students.	61,974.82

Schedule C (Continued)—Scholarship Funds

	Book Value
W. H. Moore Scholarship Fund Established 1920 in memory of Dr. W. H. Moore, '71, by his wife, Mrs. W. H. Moore, and daughters, Mrs. W. E. Steele, Miss Maude Moore, Mrs. T. L. Parsons, Mrs. J. H. Ihrie, and Mrs. J. LeGrand Everett; the income to be used for scholarship aid to worthy students.	$ 2,636.74
Thomas R. Mullen, Jr. Scholarship Fund Established April 5, 1949 by gift of T. R. Mullen in memory of his son and supplemented subsequently by additional gifts; the income to be used for scholarship aid for worthy young men and women.	83,856.51
William H. Muse Scholarship Fund Established 1963 by gift of Amy Muse, '15; the income to be used to assist worthy and deserving young men and women who are children of textile workers of North Carolina, with special consideration being given to such children who live in Erwin, North Carolina or who attend the Erwin schools.	1,756.40
Myers Park Scholarship Fund Established 1948 by contributions of the members of the congregation of the Myers Park Methodist Church, Charlotte, N. C.; the income to be used for the benefit of the Divinity School.	18,986.53
George E. Norman, Jr. Scholarship Fund Established 1963 by gift of George E. Norman, Jr. in memory of the deceased members of his family and supplemented by the Burlington Industries Foundation; the income to be used to assist worthy and deserving young men enrolled in the Department of Religion in the Graduate School of Arts and Sciences or in the graduate department of the Divinity School, who are preparing to enter the Christian ministry as pastors, teachers or foreign missionaries.	4,724.89
J. A. Odell Scholarship Fund Established 1897 by gift of James A. Odell; the income to be used for scholarship aid to worthy students.	2,849.36
J. M. Odell Scholarship Fund Established 1897 by gift of Captain J. M. Odell; the income to be used for scholarship aid to worthy students.	2,849.36
W. R. Odell Scholarship Fund Established 1940 by gifts from Fred C. Odell, '02, Mrs. Ralph M. Odell, Arthur G. Odell, '06, and supplemented from time to time by others, in memory of William R. Odell, '75, for more than 50 years a member of the Board of Trustees of Duke University; the income to be used for scholarship aid for worthy students.	21,346.13

Schedule C (Continued)—Scholarship Funds

	Book Value
THE W. R. ODELL DIVINITY SCHOLARSHIP FUND Established June, 1946 by members and friends of the Forest Hills Methodist Church, Concord, N. C., in memory of William R. Odell, '75; the income to be used for scholarship aid for students preparing for the Methodist ministry.	$ 12,845.69
HENRY A. PAGE SCHOLARSHIP FUND Established January, 1942 by gift of Henry A. Page, Jr., '07, and Gertrude Wetherill Page, in memory of his father, Henry A. Page, for many years a member of the Board of Trustees of Duke University; the income to be used for scholarship aid to worthy students, preferably those preparing for the study of medicine.	23,259.62
PARAPSYCHOLOGY SCHOLARSHIP FUND Established 1960 by gifts from Chester F. Carlson, Dr. Marie R. Higbee and Clement and Stone Foundation through the William McDougall Research Fund; to be used for scholarship aid to students preparing for work in parapsychology.	241.25
EDWARD JAMES PARRISH SCHOLARSHIP FUND Established 1921 by Mrs. Rosa Brown Parrish, in memory of her husband, Edward J. Parrish, '67; the income to be used for scholarship aid to worthy students.	2,197.78
PHYSICAL MEDICINE SCHOLARSHIP FUND Established 1963 by gift from Central Carolina Convalescent Hospital, Inc., Greensboro, N. C.; the income to be used for scholarship aid to medical students and/or post graduate fellows in physical medicine and rehabilitation at Duke University.	35,609.99
POOLED INCOME—DIVINITY SCHOOL SCHOLARSHIP FUND Established 1951 to consolidate the income of various Scholarship Funds which are restricted for the use of the Divinity School.	8,720.17
PRE-MINISTERIAL SCHOLARSHIP FUND Established 1960 by gift from Mr. and Mrs. William G. Pollard; to be used for scholarship aid to undergraduate students preparing for the ministry.	150.00
W. N. REYNOLDS MEMORIAL SCHOLARSHIP FUND Established 1961 by transfer from the W. N. Reynolds Loan Fund; the income to provide scholarships, to be awarded in the following order of preference, children of employees of R. J. Reynolds Tobacco Company, children of residents of Forsyth County, and residents of or natives of North Carolina.	565,610.75
JOHN T. RING SCHOLARSHIP FUND Established 1919 by gift of S. G. Ring and family of Kernersville, N. C., in memory of John T. Ring, '16, who was killed in France during World War I; the income to be used for scholarship aid for worthy students.	2,636.74

Schedule C (Continued)—Scholarship Funds

	Book Value
T. V. Rochelle Scholarship Fund Established 1945 by T. V. Rochelle, '14, High Point, N. C.; the income to be used for scholarship aid for a worthy and needy student who is a graduate of the High Point, N. C., High School.	$ 11,399.80
Gilbert T. Rowe Memorial Scholarship Fund Established 1960 and supplemented from time to time by gifts from friends and alumni in memory of Professor Gilbert T. Rowe, '95, and by combining in 1963 the Winston-Salem District of Western N. C. Conference Loan Fund; the income to be used for scholarship aid to senior students of the Divinity School.	24,794.61
Elbert Russell Divinity School Scholarship Fund Established 1943 and supplemented from time to time by gifts from friends and alumni of the Divinity School, in honor of Elbert Russell, Dean and Professor of Biblical Interpretation of the Divinity School, 1926-1945; the income to be used for scholarship aid for students preparing for the ministry in the Divinity School.	10,628.02
Sandals Scholarship Fund Established 1955 by contribution from Sandals, for the purpose of providing scholarship awards to rising sophomores in the Woman's College of Duke University.	1,483.00
Alex. H. Sands, Jr. Scholarship Fund Established 1956 by gifts from Alex. H. Sands, Jr.; to be used for scholarship aid to worthy students.	10,451.20
Joseph H. Separk Memorial Scholarship Fund Established 1950 by gifts from friends in memory of Joseph H. Separk, '96, for many years a member of the Board of Trustees of Duke University; the income to be used for scholarship aid to worthy students, preference to be given to students from Gaston County, N. C.	27,490.07
J. Raymond Smith Scholarship Fund Established 1939 by J. Raymond Smith, '17, Mt. Airy, N. C., in connection with the Centennial celebration of Duke University; the income to be used for scholarship aid to worthy students.	18,441.95
Willis Smith Scholarship Fund Established 1939 by Willis Smith, '10, and supplemented from time to time by other gifts; the funds to be used for scholarship purposes.	87,822.42
Hersey Everett Spence Scholarship Fund Established December, 1947 by gifts of members of the Methodist Church of Sanford, N. C., through the Methodist College Advance Fund, in honor of Hersey Everett Spence, '07, former pastor of that church and a member of the faculty of the Divinity School of Duke University; the income to be used for scholarship aid to deserving students in the Divinity School.	10,505.45

Schedule C (Continued)—Scholarship Funds

	Book Value
WARREN C. AND PATTIE LEE STACK SCHOLARSHIP FUND Established 1962 by gift of Warren C. Stack; the income to be used for scholarship aid to worthy students attending the Duke University School of Law.	$ 671.90
THOMASVILLE SCHOLARSHIP FUND Established 1940 by gifts of T. Austin Finch, '09, and J. Walter Lambeth, '16, by contributions made through the Centennial Fund; the income to be used for scholarship aid for worthy students.	2,745.95
MARY NEWBY TOMS SCHOLARSHIP FUND Established 1906 by gift of Clinton W. Toms and supplemented from time to time by additional gifts; in May, 1947, in connection with supplemental gifts to the Fund, it was established as a permanent endowment in memory of his wife, Mary Newby Toms; the income to be used for scholarship aid for worthy students; preference to be given to students from Durham and Perquimans Counties, N. C.	219,731.95
HORACE TRUMBAUER MEMORIAL FUND Established 1955 by contribution from Mrs. Helena S. Fennessy and supplemented subsequently by additional gifts in memory of her father Horace Trumbauer; the income to be used for scholarship aid to worthy students, preference being given to students majoring in subjects which relate to the practice of Architecture.	35,709.95
UNDERGRADUATE SCHOLARSHIP FUND Established 1950 to provide scholarship aid to deserving students in the undergraduate colleges of Duke University. Since 1951 this fund has been increased by the income from several scholarship Funds which were not restricted in their use.	6,396.89
THE WAGGONER SCHOLARSHIP FUND Established 1954 by contribution from T. R. Waggoner, '22, and supplemented subsequently by additional gifts in memory of his parents, Thomas Spencer Waggoner and Eva Barnwell Waggoner; the income to be used for scholarship aid for worthy undergraduate students.	7,598.95
GEORGE W. WATTS SCHOLARSHIP FUND Established 1897 by gift of George W. Watts; the income to be used for scholarship aid to worthy students.	2,849.36
WEATHERBY SCHOLARSHIP FUND Established 1912 by C. E. Weatherby, Faison, N. C.; the income to be used for scholarship aid to worthy students.	2,849.36
WEST CAMPUS CHEST SCHOLARSHIP FUND Established 1954 by the male undergraduate students of Duke University and supplemented annually for the purpose of providing scholarship awards to male students in residence in one of the undergraduate colleges.	3,448.13

Schedule C (Continued)—Scholarship Funds

	Book Value
J. D. White Scholarship Fund Established 1962 by gift from White Foundation, Inc., to be used for scholarship aid annually to worthy students, preference being given to students from Davie County.	$ 1,000.00
Lettie Pate Whitehead Foundation, Inc. Scholarship Fund Established 1963 by contribution from the Lettie Pate Whitehead Foundation, Inc.; to be used to provide funds for the proper and adequate education of poor and deserving christian white girls who are residents of any of the following States: Virginia, North Carolina, South Carolina, Tennessee, Georgia, Flordia, Alabama, Mississippi and Louisiana.	4,500.00
The Hillory M. Wilder Scholarship Fund Established 1962 by bequest from Celeste W. Blake and Kenneth M. Blake, in memory of Dr. Hillory M. Wilder; the income to be used for scholarship aid to capable, earnest young men and women of the white race and protestant faith who are residents of North Carolina and in need of financial assistance in the pursuit of study for the medical profession.	165,362.85
Florence K. Wilson Scholarship Fund Established 1955 by contribution from students of the School of Nursing, and by combining in 1961 the Duke Nurses Alumnae Association Scholarship and supplemented by gifts from the Wilson family and friends; the income to be used for scholarships for students in the School of Nursing. If the income from the fund is not used for scholarship purposes for the School of Nursing it may be transferred to the Loyalty Fund.	14,941.36
Woman's College International Student Scholarship Fund Established 1956 by gifts from students of the Woman's College of Duke University; supplemented by a gift from the Class of 1959 of the Woman's College in memory of Barbara Werner; the income to be used for scholarship aid to worthy students from other countries studying at the Woman's College of Duke University.	12,758.67
Woman's Panhellenic Scholarship Fund Established May 25, 1949 by gift of the Woman's College Panhellenic Association; income to be used for scholarship aid for a rising senior in the Woman's College of Duke University.	5,181.83
B. S. Womble Scholarship Fund Established 1961 by gifts from Edith S. Womble, Lila W. Jenkins, '35, William F. Womble, '37, Olivia W. Long, '39, Edith W. Chatham, '40, Calder W. Womble, '43, Ruth W. Lee, '49, and subsequent gift of Mr. B. S. Womble, '04; the income to be used for scholarship aid to worthy students in the Duke University Law School.	21,812.98
TOTAL	$5,192,488.28

Schedule C (Continued)—Scholarship Funds

NOTE

Certain Scholarship Funds established for the benefit of students of Duke University have independent trustees. The following information is furnished by the trustee:

MARY ALYSE SMITH SCHOLARSHIP FUND

"Established December, 1946 by Mary Alyse Smith, '30, of Burlington, North Carolina, now Mrs. Wilbur Cooper, and her father, Marvin (deceased 1952), with Central Carolina Bank & Trust Company as Trustee: supplemented in 1947, 1948, 1957 and 1958 by Mary Alyse Smith. Income to be used for scholarship aid to worthy North Carolina boys or girls entering the Freshman Class."

Book Value, June 30, 1964. $21,734.74

SCHEDULE D—STUDENT LOAN FUNDS

	Book Value
Aloe Charitable Trust Loan Fund For Students in Hospital Administration Established 1962 by gift of Aloe-Medical Division of Brunswick Corporation; to be used for loans to students in the graduate courses in hospital administration at Duke University.	$ 12,008.75
Alumni Loan Fund Established 1915 by gift from the Alumni Association.	1,647.73
Albert Anderson Loan Fund Established in 1952 by accumulation of the income from the bequest of Albert Anderson, '83, for current use in aiding and assisting in the education of worthy and deserving young men and women of the Methodist faith.	24,473.30
Denis Campbell Andrews Orthopaedic Loan Fund Established 1961 by gift of Mrs. Nancy Long; to be used for loans to medical students.	1,000.00
Virginia Flowers Baker Orthopaedic Loan Fund Established 1958 by gift of Dr. Lenox Baker, M.D., '34; to be used for loans to students in orthopaedic surgery.	1,988.26
Charles Whitlock Banner Loan Fund Established 1953 by gift from Mrs. Edward B. Benjamin; the income to be used for loans to medical students.	2,384.07
Paul M. Barringer Bequest Fund Established 1932 by bequest from Paul M. Barringer; the income to be used in educating worthy young people, preference to be given those from Rowan County, N. C.	24,013.79
Bynum Belote Loan Fund Established 1924 by E. T. Belote of Asheville, N. C., in memory of his son, Alfred Bynum Belote, student, 1923-24.	5,042.47
A. D. Betts Loan Fund Established 1919 by Reverend G. W. Vick, '11, and wife, in memory of Reverend A. D. Betts, a member of the North Carolina Conference; other contributions by Reverend W. A. Betts and Mrs. L. P. Wilkins; to be used for the aid of young men preparing for the ministry.	2,707.75
Anne Bleck Orthopaedic Loan Fund Established 1959 by gift of E. E. Bleck, M.D.; to be used for loans to students in orthopaedic surgery.	825.00
Fannie Carr Bivins Memorial Loan Fund Established 1928 by the Alumnae Association, in memory of Fannie Carr Bivins, '96; income to be loaned to young women students upon the recommendation of the Alumnae Council and approval by the Dean of Women.	5,471.71

Schedule D (Continued)—Student Loan Funds

	Book Value
Branson Loan Fund Established 1953 by bequest of Mrs. Clara S. Odell; the income to be used for loans to needy students.	$ 8,336.48
Christian Education Loan Fund Established 1921 as a part of the Christian Education movement of the Methodist Church in North Carolina; for use as a general loan fund.	2,546.01
Class of 1902 Loan Fund Established 1932 by the members of the class at their 30th Anniversary Reunion.	1,056.26
Jesse A. Cuninggim Loan Fund Established 1896 by Reverend J. A. Cuninggim, '90; to be loaned to young men preparing for the ministry.	24,344.30
J. B. Duke Church Extension Loan Fund Established 1925 by gift from James B. Duke; to be used for the aid of young men preparing for the ministry.	11,077.96
Alexander Edens Memorial Loan Fund Established 1920 by Lacy T. Edens, '24, Cora R. Edens, John A. Edens, L. D. Edens, '15, and L. F. Edens, in memory of Alexander Edens.	4,645.33
School of Forestry Loan Fund Established 1940 by gifts of various persons; to be used for the aid of students in the School of Forestry.	1,577.68
General Loan Fund Established 1900 by the North Carolina Conference and supplemented from time to time by additional contributions by both the North Carolina Conference and the Western North Carolina Conference; to be used for no other purpose than to aid worthy students of the University.	81,477.60
W. O. Goode Educational Loan Fund Established 1923 by Reverend W. O. Goode of the Western North Carolina Conference.	1,986.66
Mary Hester Hambrick Loan Fund Established 1925 by W. R. Hambrick, Haldah Satterfield, John Jackson Hambrick, '16, and Dr. Robert T. Hambrick, '19, in memory of Mary Hester Hambrick, wife and mother; loans to be made to any needy students, preferably from Person County, N. C.	2,815.70
F. M. Hanes Graduate Medical Loan Fund Established in December, 1952 by transfer from the Current Restricted "F. M. Hanes Bequest to the School of Medicine Fund"; to be used for loans to Post-Graduate Medical Students.	157,466.55

Schedule D (Continued)—Student Loan Funds

	Book Value
P. Frank Hanes Loan Fund Established 1934 by P. Frank Hanes, '11; administered by a Loan Fund Committee of the Law School; loans to needy and deserving law students.	$ 3,904.05
B. D. Heath Loan Fund Established 1921 by B. D. Heath of Charlotte, N. C.; income to be used for students preparing for the ministry, preference to be given to one student annually from Union County, N. C.	15,047.03
Holmes-McCausland Loan Fund Established 1946 by gifts of Alfred M. McCausland and Frances Holmes McCausland, '26, in memory of their parents; the principal or income to be used for loans to students in the Divinity School.	17,921.85
Holland Holton Memorial Loan Fund Established March, 1948 by friends and former students in memory of Holland Holton, '07, Professor of Education and Director of the Summer School of Duke University for many years; to be used in helping worthy young men and women in securing a college education.	6,351.69
J. B. Ivey Loan Fund Established 1922 by J. B. Ivey of Charlotte, N. C.; to be used for loans to worthy students.	3,927.34
W. K. Kellogg Foundation Loan Fund for Medical Students Established 1942 by gift of the W. K. Kellogg Foundation; to be used for loans to medical students.	19,944.62
W. K. Kellogg Foundation Loan Fund for Medical Technology Established 1943 by gift of the W. K. Kellogg Foundation; to be used for loans to students in the field of medical technology.	2,072.48
W. K. Kellogg Foundation Loan Fund for Nurses Established 1942 by gift of the W. K. Kellogg Foundation; to be used for loans to students in the School of Nursing.	3,442.80
W. K. Kellogg Foundation Loan Fund for Physical Therapy Established 1943 by gift of the W. K. Kellogg Foundation; to be used for loans to students receiving training in physical therapy.	4,318.02
W. K. Kellogg Foundation Loan Fund for Students in Hospital Administration Established 1962 by gift from W. K. Kellogg Foundation; to be used for loans to graduate students in hospital administration at Duke University.	10,027.66
Masonic Loan Fund Established 1923 by the North Carolina Masonic Educational Loan Fund Committee; to be used for aid to worthy students.	833.65

Schedule D (Continued)—Student Loan Funds

	Book Value
Medical Freshman Tuition Loan Fund Established August 28, 1960 by gift from Dr. George W. Brumley, Jr., '56, and Mrs. Jean Stanback Brumley, '58; to be loaned to freshmen in the School of Medicine.	$ 6,960.07
Medical Post-Graduate Loan Fund Established in August, 1954 by transfer from Current Restricted "F. M. Hanes Bequest to the Department of Medicine Fund"; to be used for loans to post-graduate students in medicine.	88,353.83
Medical Students Loan Fund Established 1941 by gifts of various persons.	535.90
George W. Merck Memorial Loan Fund Established 1963 by gift from the Merck Company Foundation; to be used for loans to post-graduate students in the Duke University School of Medicine.	6,026.00
Ministerial Education Loan Fund Established 1915 by the North Carolina Conference of the Methodist Church; to be used for loans to students preparing for the ministry.	4,831.29
William Neal Student Aid Fund Established 1920 by John W. Neal in memory of his son, William Neal, student in 1919; to be used for loans to worthy and needy students.	4,559.46
North Carolina Conference Board of Christian Education Loan Fund Established 1931 by gift of the Board of Christian Education of the North Carolina Conference; to be used for loans to students preparing for the ministry or other distinctive type of Christian service.	8,612.91
Marsha Paulk Memorial Loan Fund Established 1958 by gifts from the students of the Duke University School of Physical Therapy and friends of Marsha Paulk; to be used for loans to full-time students enrolled in the School of Physical Therapy.	1,539.47
Henry Simpson Proctor Loan Fund Established 1957 by gift from Mrs. A. M. Proctor, Mrs. Alberta Proctor Hyde, Mrs. Julia Proctor Makosky and Hugh W. Proctor, in memory of Arthur Marcus Proctor, '10; the income to be used for aid to graduate students in the Department of Education.	7,537.68
Psychiatry Loan Fund Established 1956 by transfer from Psychiatry Department Operating Fund; to be used for loans to post-graduate students in Psychoanalysis.	14,016.29

Schedule D (Continued)—Student Loan Funds

	Book Value
W. N. Reynolds Loan Fund Established by W. N. Reynolds, '86, of Winston-Salem, N. C.; to be used for loans to boys and girls of North Carolina seeking an education at Duke University; preference, however, to be given to the children of employees of the R. J. Reynolds Tobacco Company, regardless of residence.	$ 167,199.32
Roanoke Rapids High School Loan Fund Established 1925 by the graduating class of the Roanoke Rapids High School, Roanoke Rapids, N. C.; to be used for loans to students who are graduates of that school.	806.36
Scott Loan Fund Established in October, 1952 by I. M. Scott, '32, and supplemented subsequently by additional gifts; to be used for loans to Medical students.	4,987.24
Marian Sanford Sealy Loan Fund Established April 27, 1960 by gift from the Durham-Orange County Medical Auxiliary of Durham, North Carolina and supplemented by various other gifts in memory of the late Marian Sanford Sealy, '59; the principal as well as any interest earned thereon to be used for loans to full time graduate and undergraduate students in the School of Nursing who are legal and bona fide residents of the state of North Carolina.	3,365.65
The Colonel Hamilton Folts Searight Loan Fund Established 1957 by gift from Mrs. Louise Searight Morell, '42; to be used for the aid of students pursuing a science curriculum.	537.27
Joseph F. Stein Student Loan Fund Established 1961 by gifts of Mr. Joseph F. Stein to the Duke University School of Nursing; to be used for loans to students in the School of Nursing.	4,252.88
Surgical Post-Graduate Loan Fund Established 1954 by transfer from the Department of Surgery Fund; to be used for loans to post-graduate students in surgery.	5,178.64
Ella Wescott Tuttle Loan Fund Established 1923 by Reverend D. H. Tuttle, '80, in memory of his wife, Ella Wescott Tuttle; to be used for loans to worthy young women seeking an education at Duke University.	4,574.89
Joshua Vick Memorial Loan Fund Established 1920 by Mrs. J. W. Vick in memory of her husband, Joshua Vick; to be used for loans to needy students.	2,124.11
Wake County Alumnae Loan Fund Established 1924 by the Raleigh Chapter of the Alumnae Association; to be used for loans to worthy women students.	3,727.52

Schedule D (Continued)—Student Loan Funds

	Book Value
HENRY CARSON WEST LOAN FUND Established 1954 by gift from H. Carson West, '17, and supplemented subsequently by additional gifts; to provide loans for upper-classmen from North Carolina.	$ 1,551.64
LUCY T. WOOLARD MEDICAL LOAN FUND Established 1962 in memory of Lucy T. Woolard by her daughters, Wylma, Rachel, and Margaret Woolard and Thelma Soloway; the principal and income to be used for loans to interns and residents in the Duke University Medical Center whose interests include the study of diseases of the blood.	1,506.67
MARY POAGE WOOTEN LOAN FUND Established 1922 by Reverend John C. Wooten, '98, in memory of his wife, Mary Poage Wooten; to be used for loans to worthy students.	2,429.64
TOTAL	$ 811,899.28

NOTE

Certain Endowed Loan Funds established for the benefit of students of Duke University have independent trustees. The following is based on the report of the Trustee:

ALBERT ANDERSON BEQUEST

Wachovia Bank and Trust Company, Raleigh, North Carolina, Trustee of trust created under Will of Albert Anderson for use as a Loan Fund to Methodist Students attending Duke University.

Total Book Value at the close of the Trust Year on March 27, 1964. $29,742.60

SCHEDULE E—CURRENT RESTRICTED FUNDS

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Air Force:				
Contract AF-01 (611) 1258	$ 320.29*	$ 320.29	$	$ .....
Contract AF-01 (611) 1374	.....	788.71	1,061.05	272.34*
Contract AF-18 (600) 497	.....	.....	41.86	41.86*
Contract AF-33 (616) 6803	1,393.34*	1,026.18	1,765.52	2,132.68*
Contract AF-33 (657) 8854	2,812.77*	8,409.89	5,629.70	32.58*
Contract AF-33 (657) 10279	1,561.31*	6,126.64	8,321.45	3,756.12*
Contract AF-41 (609) 1999	46.30*	8,201.82	29,670.25	21,514.73*
Contract AF-41 (609) 2283	.....	388.27	2,938.26	2,549.99*
Contract AF-41 (609) 2415	.....	.....	175.50	175.50*
Contract AF-41 (657) 312	12,468.86*	12,481.18	.....	12.32
Contract AF-41 (657) 368	36.92*	19.00	.....	17.92*
Contract AF-49 (638) 354	108.15*	.....	3.40	111.55*
Contract AF-49 (638) 765	30,692.68*	20,447.16	31.50	10,277.02*
Grant AF-AFOSR-57-63	8,588.33	.....	7,140.19	1,448.14
Grant AF-AFOSR-57-64	.....	25,043.00	21,887.00	3,156.00
Grant AF-AFOSR-61-51	2,512.75	.....	2,512.75	.....
Grant AF-AFOSR-62-162	27,268.24	.....	27,588.24	320.00*
Grant AF-AFOSR-62-164	4,051.07	.....	4,051.07	.....
Grant AF-AFOSR-62-327	26,828.15	.....	26,806.21	21.94
Grant AF-AFOSR-435-63	.....	20,376.00	3,034.02	17,341.98
Grant AF-AFOSR-493-64	.....	93,447.00	61,796.25	31,650.75
Army:				
Contract DA-18-064-AMC-231 (A)	.....	.....	3,419.47	3,419.47*
Contract DA-18-064-404-CML-170	7,287.37*	13,327.10	10,906.95	4,867.22*
Contract DA-31-124-ARO (D)-6	7,004.79*	17,643.72	12,772.83	2,133.90*
Contract DA-31-124-ARO (D)-9	.....	15,671.51	30,904.36	15,232.85*
Contract DA-31-124-ARO (D)-10	2,033.93*	49,697.57	71,071.40	23,407.76*
Contract DA-31-124-ARO (D)-13	24,617.58*	149,889.46	157,338.78	32,066.90*
Contract DA-31-124-ARO (D)-19	2,719.77*	5,701.00	2,981.23	.....
Contract DA-31-124-ARO (D)-20	1,444.59*	1,656.00	29,937.12	29,725.71*
Contract DA-31-124-ARO (D)-48	16,171.17*	56,186.70	42,816.37	2,800.84*
Contract DA-31-124-ARO (D)-49	56,076.08*	85,384.70	30,101.47	792.85*
Contract DA-31-124-ARO (D)-50	2,840.34*	8,800.00	5,959.66	.....
Contract DA-31-124-ARO (D)-59	1,397.50*	26,406.85	32,082.58	7,073.23*
Contract DA-31-124-ARO (D)-60	2,364.68*	10,313.52	8,673.35	724.51*
Contract DA-31-124-ARO (D)-100	940.06*	77,596.46	123,028.54	46,372.14*
Contract DA-31-124-ARO (D)-120	120.40*	1,458.32	4,580.62	3,242.70*
Contract DA-31-124-ARO (D)-122	990.90*	2,366.74	3,296.32	1,920.48*
Contract DA-31-124-ARO (D)-162	.....	38,285.68	92,205.42	53,919.74*
Contract DA-31-124-ARO (D)-164	.....	7,117.69	14,769.02	7,651.33*
Contract DA-31-124-ARO (D)-167	.....	12,579.83	25,749.11	13,169.28*
Contract DA-31-124-ARO (D)-186	.....	.....	2,098.40	2,098.40*
Contract DA-31-124-ARO (D)-206	.....	.....	1,306.36	1,306.36*
Contract DA-31-124-ARO (D)-227	.....	.....	557.46	557.46*
Contract DA-31-124-ORD-1	64,109.57*	184,333.18	138,337.56	18,113.95*
Contract DA-31-124-ORD-5	5,938.53*	5,938.53	.....	.....
Contract DA-31-124-ORD-7	1,050.00*	2,234.83	2,867.20	1,682.37*
Contract DA-31-124-ORD-10-2	1,326.65*	1,326.65	.....	.....
Contract DA-31-124-ORD-10-3	.....	1,162.68	1,162.68	.....
Contract DA-31-124-ORD-10-4	332,840.42*	676,296.31	475,887.84	132,431.95*
Contract DA-31-124-ORD-10-5	1,897.10*	5,155.71	4,225.54	966.93*
Contract DA-31-124-ORD-10-8	38.23	.....	58.74	20.51*
Contract DA-31-124-ORD-10-11	8,084.95*	21,561.20	14,293.45	817.20*
Contract DA-31-124-ORD-10-12	15,433.08*	36,620.14	30,204.72	9,017.66*
Contract DA-36-034-ORD-2040	3,234.83*	1,883.09	.....	1,351.74*

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Contract DA-36-034-ORD-2773RD	.....	44.00	13.72	30.28
Contract DA-36-034-ORD-2864RD	531.00*	745.70	214.70	.....
Contract DA-49-193-MD-2153	1,689.48*	19,740.35	19,041.17	990.30*
Grant DA-ARO (D)-31-123-G128	13,312.83	32,000.00	32,276.61	13,036.22
Grant DA-ARO (D)-31-124-G128	253.50	154.87	.....	408.37
Grant DA-ARO (D)-31-124-G202	15,554.89	17,069.00	31,668.91	954.98
Grant DA-ARO (D)-31-124-G303	2,649.54	.....	2,463.51	186.03
Grant DA-ARO (D)-31-124-G332	7,830.16	16,389.50	23,311.47	908.19
Grant DA-ARO (D)-31-124-G354	4,531.31	.....	4,032.74	498.57
Grant DA-ARO (D)-31-124-G374	.....	32,633.00	12,159.49	20,473.51
Grant DA-ARO (D)-31-124-G378	7,126.95	25,690.00	14,152.28	18,664.67
Grant DA-ARO (D)-31-124-G409	13,008.43	16,889.14	23,527.13	6,370.44
Grant DA-ARO (D)-31-124-G493	.....	21,758.00	6,534.54	15,223.46
Grant DA-ARO (D)-31-124-G561	.....	.....	30.50	30.50*
Grant DA-ORD-4	33.72*	33.72	.....	.....
Grant DA-ORD-19-066-60-G20	856.71	101.25	979.37	21.41*
Grant DA-ORD-31	1,927.54*	.....	.....	1,927.54*
Grant DA-ORD-31-124-60-G63	1,585.71	.....	1,291.47	294.24
Grant DA-ORD-41	140.45	.....	.73	139.72
Atomic Energy Commission:				
Contract AT (40-1) 1067#3	77,247.95*	286,222.63	310,837.70	101,863.02*
Contract AT (40-1) 1647	7.98	.....	6.38	1.60
Contract AT (40-1) 1827	1,603.50	14,481.00	15,287.09	797.41
Contract AT (40-1) 2002	3,363.02	8,966.70	7,025.57	5,304.15
Contract AT (40-1) 2059	11.21	.....	.....	11.21
Contract AT (40-1) 2430	33,843.37	9,927.10	105,648.80	61,878.33*
Contract AT (40-1) 2479	3,368.22	.....	.....	3,368.22
Contract AT (40-1) 2790	10,660.28	.....	10,038.49	621.79
Contract AT (40-1) 2919	8,541.33	2,272.10	22,045.25	11,231.82*
Contract AT (40-1) 3065	23,433.95	7,100.00	71,900.42	41,366.47*
Contract AT (40-1) 3094	3,372.22	4,109.85	9,777.31	2,295.24*
Contract AT (40-1) 3195	.....	10,350.00	6,636.23	3,713.77
Contract BM-15-6 63	7,125.00	.....	7,125.00	.....
Contract BM-16-36-63	9,905.68	.....	9,905.68	.....
National Aeronautics Space Administration:				
Contract NAS-5-1980	15,837.75*	15,837.75	.....	.....
Contract NAS-5-3815	.....	.....	2,272.70	2,272.70*
Grant NSG-152-61	19,304.49	17,622.00	35,426.90	1,499.59
Grant NSG-251-62	41.04	13.39	54.43	.....
Grant NSG-T-16	59,000.00	59,000.00	31,821.15	86,178.85
National Science Foundation:				
Cash Fund	.....	.....	411,558.13	411,558.13*
Cooperative Graduate Fellowship Program	3,702.75	25,130.00	26,208.73	2,624.02
Graduate Fellowship Grant	12,383.34	29,100.00	29,744.94	11,738.40
Senior Foreign Scientists Grant	.....	15,421.00	18,128.13	2,707.13*
Summer Teaching Fellowships Grant	1,771.60	2,517.90	2,724.00	1,565.50
Grant G-6359	.....	2,267.33	2,267.33	.....
Grant G-7079	.....	218.57	218.57	.....
Grant G-7464	.....	1,111.34	1,111.34	.....
Grant G-9112	1,609.95*	1,609.95	.....	.....
Grant G-9841	.....	4,464.82	4,464.82	.....
Grant G-11774	.....	510.00	510.00	.....
Grant G-12453	.....	5,100.70	5,321.90	221.20*
Grant G-12707	.....	2,072.80	2,072.80	.....
Grant G-12888	.....	2,179.75	2,179.75	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant G-13129	.....	7,825.10	7,825.10	.....
Grant G-13177	188.10	6,159.91	6,348.01	.....
Grant G-13194	220.00	.....	220.00	.....
Grant G-13215	.20*	9,859.82	9,859.62	.....
Grant G-13234	.....	2,672.66	2,672.66	.....
Grant G-13954	.....	3,171.32	3,171.32	.....
Grant G-14051	13.10*	9,021.20	9,008.10	.....
Grant G-14527	.....	19,026.13	19,026.13	.....
Grant G-14636	.....	7,578.83	7,578.83	.....
Grant G-14741	.....	6,145.05	6,145.05	.....
Grant G-14986	1,457.88*	1,457.88	.....	.....
Grant G-16189	73.70*	73.70	.....	.....
Grant G-16255	.....	6,909.88	6,909.88	.....
Grant G-16484	.....	3,325.54	3,325.54	.....
Grant G-16567	.....	33.30	33.30	.....
Grant G-16842	.....	18,794.83	18,794.83	.....
Grant G-16845	.....	7,150.49	7,150.49	.....
Grant G-17081	.....	19,455.03	19,455.03	.....
Grant G-17230	.....	5,164.00	5,164.00	.....
Grant G-17477	79.00	18,938.19	19,017.19	.....
Grant G-17619	740.90*	740.90	.....	.....
Grant G-17669	.....	44,285.30	44,285.30	.....
Grant G-18098	44.00	3,062.18	4,658.84	1,552.66*
Grant G-18124	83.00	5,140.69	5,223.69	.....
Grant G-18535	.....	2,873.32	3,611.63	738.31*
Grant G-18799	.....	7,337.26	7,337.26	.....
Grant G-19098	70.00	28.82	98.82	.....
Grant G-19537	.....	5,520.12	5,520.12	.....
Grant G-19761	.....	30,680.74	30,680.74	.....
Grant G-19849	16.00	19,650.71	18,716.71	950.00
Grant G-19899	.....	464.75	464.75	.....
Grant G-19901	23.00	13,170.64	13,193.64	.....
Grant G-20533	.....	9,161.36	9,161.36	.....
Grant G-21027	.....	37,170.38	37,170.38	.....
Grant G-21262	.....	15,251.92	15,251.92	.....
Grant G-21734	.....	7,342.13	7,342.13	.....
Grant G-21848	.....	34,068.33	34,068.33	.....
Grant G-21879	.....	1,417.94	1,417.94	.....
Grant G-21955	.....	2,583.24	2,583.24	.....
Grant G-22386	.....	5,240.24	5,240.24	.....
Grant G-22776	4,966.72	454.83	5,421.55	.....
Grant G-23399	.....	2,692.34	2,692.34	.....
Grant G-23533	.....	.....	.....	.....
Grant G-23570	.....	11,284.98	11,284.98	.....
Grant G-23652	.....	2,980.58	2,980.58	.....
Grant G-23928	.....	13,456.61	13,456.61	.....
Grant G-24388	1,443.76*	20,504.96	19,061.20	.....
Grant G-25128	.....	21,763.41	21,763.41	.....
Grant GA-71	.....	9,784.57	9,784.57	.....
Grant GB-82	3.30*	9,480.05	9,476.75	.....
Grant GB-98	.....	5,502.59	5,502.59	.....
Grant GB-150	.....	5,839.58	5,839.58	.....
Grant GB-158	.....	5,357.05	5,357.05	.....
Grant GB-349	.....	6,614.26	6,693.78	79.52*
Grant GB-437	.....	8,013.90	8,013.90	.....
Grant GB-471	.....	19,037.93	19,037.93	.....
Grant GB-512	.....	17,379.40	17,377.40	2.00

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant GB-727	.....	16,360.85	16,360.85	.....
Grant GB-905	.....	4,381.29	4,384.29	.....
Grant GB-992	.....	699.61	699.61	.....
Grant GB-1070	.....	8,021.29	8,021.29	.....
Grant GB-1117	.....	4,130.94	4,130.94	.....
Grant GB-1219	.....	21,794.98	21,794.98	.....
Grant GB-1239	.....	123.71	123.71	.....
Grant GB-1315	.....	32,779.54	32,779.54	.....
Grant GB-1351	.....	14,728.23	14,728.23	.....
Grant GB-1356	.....	2,761.88	2,761.88	.....
Grant GB-1416	.....	16,199.44	16,199.44	.....
Grant GB-1667	.....	14,627.76	14,539.76	88.00
Grant GB-1672	.....	22,345.44	22,345.44	.....
Grant GB-1699	.....	8,189.18	8,189.18	.....
Grant GB-1737	.....	2,912.77	2,912.77	.....
Grant GB-1879	.....	1,145.41	1,145.41	.....
Grant GB-1922	.....	2,693.92	2,686.51	7.41
Grant GB-1967	.....	453.02	453.02	.....
Grant GB-2087	.....	120.30	120.30	.....
Grant GB-2159	.....	4,033.04	4,033.04	.....
Grant GB-2191	.....	4,518.87	4,518.87	.....
Grant GB-2225	.....	74.40	74.40	.....
Grant GB-2279	.....	844.44	844.44	.....
Grant GB-2313	.....	3,391.76	3,391.76	.....
Grant GB-2353	.....	875.19	875.19	.....
Grant GB-2455	.....	1,873.37	1,873.37	.....
Grant GB-2932	.....	1,222.44	1,222.44	.....
Grant GE-100	35.00	587.89	622.89	.....
Grant GE-306	30.00	12,611.61	12,641.61	.....
Grant GE-611	.....	92,984.21	92,984.21	.....
Grant GE-1093	.....	5,794.25	5,794.25	.....
Grant GE-1861	.....	8,921.32	8,921.32	.....
Grant GE-1939	.....	3,530.05	3,530.05	.....
Grant GE-1946	.....	4,238.72	4,238.72	.....
Grant GE-2558	.....	68,731.31	68,731.31	.....
Grant GE-2829	.....	3,154.80	3,154.80	.....
Grant GE-2970	.....	40,121.35	40,121.35	.....
Grant GE-4032	.....	4,370.55	4,370.55	.....
Grant GP-65	.....	9,061.94	9,061.94	.....
Grant GP-407	.....	11,141.09	11,141.09	.....
Grant GP-1593	.....	19,276.35	19,276.35	.....
Grant GP-1797	.....	9,761.22	9,761.22	.....
Grant GP-1799	.....	42,738.52	42,810.85	72.33*
Grant GP-1881	.....	6,491.10	6,491.10	.....
Grant GP-1913	.....	12,158.62	12,158.62	.....
Grant GP-2065	.....	17,563.28	17,563.28	.....
Grant GP-2140	.....	38,210.96	38,210.96	.....
Grant GP-2274	.....	7,486.29	7,486.29	.....
Grant GP-2447	.....	4,981.57	5,371.23	389.66*
Grant GS-73	.....	12,495.46	12,495.46	.....
Grant GS-89	.....	17,587.40	17,587.40	.....
Navy:				
Contract NONR-1181 (03)	304.80*	304.80	.....	.....
Contract NONR-1181 (04)	30,194.41*	.....	.....	30,194.41*
Contract NONR-1181 (05)	6,189.21*	14,835.28	14,695.19	6,049.12*
Contract NONR-1181 (06)	2,806.43*	13,445.68	11,847.38	1,208.13*
Contract NONR-1181 (07)	969.81*	5,559.11	6,721.80	2,132.50*

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Contract NONR-1181 (10)	3,228.79*	15,216.23	12,804.37	816.93*
Contract NONR-1181 (11)	1,927.19*	17,238.72	19,945.61	4,634.08*
Contract NONR-1181 (12)	6,131.04*	23,354.80	27,479.09	10,255.33*
Contract NONR-1181 (13)	4,066.09*	9,695.82	8,914.54	2,584.81*
Contract NONR-1181 (14)	5,802.47*	18,151.91	18,179.67	5,830.23*
Contract NONR-1537 (00)	3,970.49*	9,751.00	21,750.45	15,969.94*
Contract NONR-2103 (00)	3,215.93*	8,000.00	9,653.21	4,869.14*
Contract NOP-1465	400.06*	400.06	.....	.....
Contract NOP-1591	.....	.....	2,630.09	2,630.09*
Contract NORD-16640 Subcontract #2	9,338.10*	16,184.11	6,846.01	.....
North Carolina Board of Health:				
Contract for Premature Infant Care	.....	33,873.74	39,347.23	5,473.49*
Physical Therapy Contract	3,390.08	16,736.00	18,309.49	1,816.59
Small Business Administration:				
Grant for Research in Legal and Economic-Legal Aspects of Small Business Planning	1,712.34*	1,712.34	.....	.....
Grant for Research in Legal and Economic-Legal Aspects of Small Business Planning	1,312.12*	.....	1,879.34	3,191.46*
U. S. Department of Agriculture:				
Contract ASFS-20, 148 Supplement #12	206.77	.....	206.77	.....
Contract ASFS-20, 148 Supplement #18	.....	2,160.00	2,970.00	810.00*
Forest Service Grant	.....	14,845.00	1,035.61	13,809.39
U. S. Department of Interior Fish and Wildlife Service:				
Contract 14-17-002-11	33.85*	33.85	.....	.....
Contract 14-17-0002-30	10,966.71*	5,214.45	1,048.96	6,801.22*
Contract 14-17-0002-60	.....	15,274.63	23,094.93	7,820.30*
Contract 14-17-0007-62	5,788.00	.....	2,635.00	3,153.00
Grant 14-17-0007-130(G)	6,140.00	4,780.00	4,090.55	6,829.45
U. S. Office of Vocational Rehabilitation:				
Grant No. 431-T-63	15,600.00	.....	13,438.80	2,161.20
Grant No. RD-733-61 (C1)	882.32	.....	.....	882.32
Grant No. RD-733-63 (C2)	10,479.26	15,049.36	12,875.78	12,652.84
Grant No. RD-783	543.49	.....	.....	543.49
Grant No. RD-783-63 (C1)	4,958.14	4,421.00	10,179.01	799.87*
Grant No. RD-1358-M-64	.....	20,000.00	5,891.83	14,108.17
Grant No. RD-1363-M-64	.....	9,000.00	1,333.65	7,666.35
Grant No. RD-1426-M-64	.....	25,000.00	5,557.01	19,442.99
Project No. 733-62 (C1)	1,054.35	38.01	.....	1,092.36
Teaching Grant No. 98-62	76.75*	4 05	.....	72.70*
Grant No. 98-63	4,418.92	.....	4,372.00	46.92
Grant No. 98-T-64	.....	26,525.17	19,601.04	6,924.13
U. S. Public Health Service:				
Contract OE-2-10-033 Project #1316B	9,262.02*	23,583.00	11,217.89	3,103.09
Contract OE-3-13-070	2,624.60	20,976.00	22,015.11	1,585.49
Contract PH-86-63-174	.....	.....	25,604.06	25,604.06*
General Research Support Grant #SO1 FR-05105-01	85,641.72	154,476.00	154,557.53	85,560.19
General Research Support Grant #1 SO1 FR-05405-01	.....	104,517.00	77,869.64	26,647.36
Grant A836 (C5)	6,175.33	.....	6,175.33	.....
Grant A1391 (C5)	117.90	.....	117.90	.....
Grant A1596 (C4)	.....	22.00	22.00	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant A1596 (C5)	526.43	.....	526.43	.....
Grant A2146 (C5)	6,851.20	.....	6,851.20	.....
Grant A2819 (C2)	365.51*	640.74	275.23	.....
Grant A2843 (C2)	133.88	.....	133.88	.....
Grant A2903 (C3)	161.32*	205.32	44.00	.....
Grant A3255 (C3)	712.02	.....	712.02	.....
Grant A3302 (C1)	.....	134.05	134.05	.....
Grant A4315 (C1)	88.00	.....	88.00	.....
Grant A4576	.....	897.30	897.30	.....
Grant A4576 (C1)	75.79	.....	75.79	.....
Grant A4662 (C1)	188.00	.....	100.00	88.00
Grant A4811	.....	427.50	427.50	.....
Grant A4811 (C1)	2.95	.....	2.95	.....
Grant A4839 (C2)	1,114.83	.....	1,114.83	.....
Grant A5258 (C5)	4,005.00*	4,005.00	.....	.....
Grant A5427	4,801.40	.....	4,801.40	.....
Grant A5812	660.21*	660.21	.....	.....
Grant A5930	1,268.05*	1,268.05	.....	.....
Grant A6118	840.77	.....	840.77	.....
Grant AH-4828	14.99	.....	14.99	.....
Grant AI-01659-06	2,730.22*	5,750.00	3,019.78	.....
Grant AI-01659-07	.....	19,683.82	13,972.70	5,711.12
Grant AI-01866-06	1,520.98	5,203.00	3,570.37	3,153.61
Grant AI-01991-05	2,587.45	2,198.00	4,785.45	.....
Grant AI-01991-06	.....	10,638.34	2,244.27	8,394.07
Grant AI-02035-05	3,838.16	9,050.00	10,962.91	1,925.25
Grant AI-02035-06	.....	14,805.75	11,805.07	3,000.68
Grant AI-03988-02	8,835.30	.....	6,531.80	2,303.50
Grant AI-03988-03	2,258.70	11,630.00	9,881.66	4,007.04
Grant AI-04827-01	797.98	165.06	963.04	.....
Grant AI-04827-02	.....	8,592.00	6,893.16	1,698.84
Grant AI-05010-01A1	.....	33,945.00	33,051.75	893.25
Grant AI-05010-02	.....	.....	590.73	590.73*
Grant AI-05601-01	.....	21,084.00	6,875.34	14,208.66
Grant AI-05850-01	.....	37,756.00	21,558.39	16,197.61
Grant AI-K3-9858 (C1)	211.37*	211.37	.....	.....
Grant AI-K3-14, 797 (C1)	61.45*	61.45	.....	.....
Grant AI-K6-18, 399	3,421.60	.....	3,642.05	220.45*
Grant 2-T1-AI-31-06A1	.....	30,000.00	30,002.44	2.44*
Grant 5-K3-AI-9858-03	.....	16,680.00	16,660.67	19.33
Grant 5-K3-AI-14, 797-03	.....	13,731.00	13,887.34	156.34*
Grant 5-K6-AI-18, 399-02	.....	22,746.00	18,854.29	3,891.71
Grant AM-01251-07-GM	6,799.50	.....	6,799.50	.....
Grant AM-01251-08	.....	18,908.14	9,417.77	9,490.37
Grant AM-01324-07	2,587.12	8,712.00	11,299.12	.....
Grant AM-01324-08	.....	26,871.58	17,806.07	9,065.51
Grant AM-01391-07	2,063.94	13,938.00	16,001.94	.....
Grant AM-01391-08	.....	14,939.20	18,033.83	3,094.63*
Grant AM-01596-07	576.07	9,412.02	10,040.88	52.79*
Grant AM-01596-08S1	.....	4,004.00	2,474.26	1,529.74
Grant AM-01956-05	3,635.23	.....	6,963.10	3,327.87*
Grant AM-01956-06S1	.....	54,466.00	32,339.75	22,126.25
Grant AM-01987-05	240.93	20.32	.....	261.25
Grant AM-02094-05	7,897.49	9,798.00	14,762.69	2,932.80
Grant AM-02146-07	983.84	4,853.00	3,357.93	2,478.91
Grant AM-02819-04	2,829.94*	6,849.18	4,019.24	.....
Grant AM-02903-05	5,817.54*	11,968.00	6,150.46	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant AM-02903-06	.....	13,301.82	16,712.22	3,410.40*
Grant AM-03255-05	2,310.37	14,150.68	19,161.22	2,700.17*
Grant AM-04130-03	225.73*	225.73	.....	.....
Grant AM-04130-04	4,728.59	15,265.78	21,021.33	1,026.96*
Grant AM-04130-05	.....	.....	696.26	696.26*
Grant AM-04315-03PC	2,369.56	.....	2,369.56	.....
Grant AM-04315-04	.....	27,857.72	27,952.91	95.19*
Grant AM-04521-03	1,202.75*	4,312.00	3,109,25	.....
Grant AM 04521-04	.....	17,296.52	19,178.41	1,881.89*
Grant AM-04576-03	24,617.45	19,042.00	43,659.45	.....
Grant AM-04576-04	.....	59,448.82	49,728.13	9,720.69
Grant AM-04662-03	8,429.69	11,162.00	19,920.73	329.04*
Grant AM-04662-04	.....	19,029.87	8,374.19	10,655.68
Grant AM-04839-04	5,751.98	14,887.70	15,803.77	4,835.91
Grant AM-04839-05	.....	37,826.00	34,150.36	3,675.64
Grant AM-05258-07	794.95*	14,376.00	13,581.05	.....
Grant AM-05258-08	.....	11,067.17	4,584.82	6,482.35
Grant AM-05427-02	10,495.92	18,386.86	27,149.55	1,733.23
Grant AM-05427-03	.....	19,114.00	16,898.08	2,215.92
Grant AM-05500-02	1,320.09	300.94	1,621.03	.....
Grant AM-05509-02	3,632.44*	8,800.00	3,605.80	1,561.76
Grant AM-05509-03	.....	19,200.00	17,381.87	1,818.13
Grant AM-05559-02	7,904.95*	9,688.00	1,629.25	153.80
Grant AM-05559-03	.....	20,616.00	12,941.75	7,674.25
Grant AM-05812-02	840.60	10,292.00	11,132.60	.....
Grant AM-05812-03	.....	12,409.04	15,944.65	3,535.61*
Grant AM-05930-02	2,005.28	11,367.74	13,585.41	212.39*
Grant AM-05930-03	.....	10,958.00	10,900.88	57.12
Grant AM-06118-02	7,863.90	17,396.23	24,318.61	941.52
Grant AM-06118-03	.....	6,291.00	4,403.73	1,887.27
Grant AM-06306-01	3,716.34*	7,772.00	4,034.66	21.00
Grant AM-06306-02	.....	13,989.52	11,840.60	2,148.92
Grant AM-06677-01	12,049.86	.....	7,902.65	4,147.21
Grant AM-06677-02	.....	18,083.00	9,239.11	8,843.89
Grant AM-06815-01	14,955.08	13,223.00	26,238.45	1,939.63
Grant AM-06815-02	.....	23,490.00	20,834.96	2,655.04
Grant AM-06851-01	3,105.50*	12,657.00	9,731.91	180.41*
Grant AM-06851-02	.....	8,790.00	10,837.88	2,047.88*
Grant AM-07044-01	3,684.00	3,684.00	7,320.45	47.55
Grant AM-07044-02	.....	2,026.00	.....	2,026.00
Grant AM-07048-01	12,355.29*	18,038.00	5,925.96	243.25*
Grant AM-07048-02	.....	10,355.00	17,078.37	6,723.37*
Grant AM-07420-01	352.88*	25,339.00	21,705.31	3,280.81
Grant AM-07420-02	.....	.....	1,061.13	1,061.13*
Grant AM-07485-01	715.86*	10,000.00	3,937.70	5,346.44
Grant AM-07549-01A1	.....	13,706.00	8,409.59	5,296.41
Grant AM-07562-01	3,597.00	11,343.00	17,171.58	2,231.58*
Grant AM-07562-02	.....	3,838.00	3,968.10	130.10*
Grant AM-07583-01	.....	29,647.00	21,561.06	8,085.94
Grant AM-07785-01A1	.....	20,900.00	21,094.15	194.15*
Grant AM-07883-01	.....	26,529.00	20,457.26	6,071.74
Grant AM-08054-01	.....	12,462.00	10,069.41	2,392.59
Grant AM-08081-01	.....	3,280.00	1,902.70	1,377.30
Grant AM-08292-01	.....	21,406.00	15,581.55	5,824.45
Grant AM-08500-01	.....	4,426.00	3,075.65	1,350.35
Grant AM-K6-16, 693	540.61	1,953.90	2,494.51	.....
Grant AM-K6-18433	62.13*	28.80	.....	33.33*

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant 1-F2-AM-14, 932-01	.....	500.00	.....	500.00
Grant 1-F2-AM-19, 006-01	102.74	.....	102.56	.18
Grant 1-F3-AM-11, 580-01	.....	500.00	289.06	210.94
Grant 1-F3-AM-19, 295-01	.....	500.00	373.33	126.67
Grant 2-F2-AM-18, 902-02	.....	500.00	407.60	92.40
Grant 5-F3-AM-13, 251-03	.....	500.00	535.00	35.00*
Grant 6-F2-AM-20, 707-01A1	.....	500.00	178.80	321.20
Grant 1-K3-AM-17, 954-01	.....	13,624.00	13,680.25	56.25*
Grant 1-K2-AM-19, 401-01	.....	19,988.00	20,176.66	188.66*
Grant 1-K3-AM-19, 447-01	.....	13,688.00	13,898.68	210.68*
Grant 5K6-AM-18, 433-02	3,807.00	11,415.00	15,158.44	63.56
Grant T1-AM-5012-08 & O8S1	.....	59,325.00	46,557.49	12,767.51
Grant T1-AM-5074-08 & O8S1	28,034.00	91,385.34	118,339.21	1,080.13
Grant T1-AM-5093-07 & O7S1	14,141.00	46,838.90	58,285.04	2,694.86
Grant T1-AM-5335-02	7,987.00	29,798.00	35,160.28	2,624.72
Grant APD-18, 902	.37	.....	.37	.....
Grant ASP-13, 227-C1	1.37*	1.37	.....	.....
Grant ASP-13, 251-C1	1.96*	1.96	.....	.....
Grant 2A-5012 (C6)	10,063.15	.....	8,730.14	1,333.01
Grant 2A-5074 (C6) (C6S)	13,576.16	.....	8,154.18	5,421.98
Grant 2A-5093 (C5)	4,751.51	.....	4,751.51	.....
Grant 2A-5335	9,656.50	.....	5,915.24	3,741.26
Grant B1161 (C5)	750.87	.....	750.87	.....
Grant B2434 (C2)	194.87	.....	194.87	.....
Grant B2793-R1	.....	131.96	131.96	.....
Grant B2839 (C1)	7,162.18	.....	7,162.18	.....
Grant B3670	9,164.43	.....	9,164.43	.....
Grant B3670 (C1) (S2)	9,605.39*	18,896.41	9,291.02	.....
Grant B3873	26,338.36	.....	26,338.36	.....
Grant B3897	4,479.89	.....	4,479.89	.....
Grant 2B5212 (C3)	16,880.16	.....	13,596.57	3,283.59
Grant 2B5232 (C3)	16,080.65*	26,956.00	5,334.51	5,540.84
Grant 2B5358 (C1)	8,823.08	.....	8,823.08	.....
Grant C2602 (C4)	5,427.45	.....	5,427.45	.....
Grant C4572-C1	.....	521.53	521.53	.....
Grant C4572 (C3)	20.29	.....	20.29	.....
Grant CA-02602-06	917.15*	7,455.92	6,538.77	.....
Grant CA-02659-08	6,202.76	.....	5,408.74	794.02
Grant CA-02659-09	5,753.02	17,216.00	13,400.19	9,568.83
Grant CA-02659-10	.....	4,070.00	837.56	3,232.44
Grant CA-03177-07	2,159.93*	16,242.00	14,082.07	.....
Grant CA-03177-08	.....	17,188.57	21,085.56	3,896.99*
Grant CA-03252-06	6,823.06	.....	4,316.43	2,506.63
Grant CA-04142-05	82.98*	82.98	.....	.....
Grant CA-04298-05	7,374.75	7,560.00	14,222.74	712.01
Grant CA-04298-06	.....	14,040.00	6,809.77	7,230.23
Grant CA-04455-04	4,066.26	.....	4,066.26	.....
Grant CA-04455-05	2,598.61	17,931.03	19,008.19	1,521.45
Grant CA-04455-06	.....	4,943.00	2,509.48	2,433.52
Grant CA-04572-05	14,909.90	154,917.00	136,463.48	33,363.42
Grant CA-04572-06	.....	50,860.00	34,530.41	16,329.59
Grant CA-04605-04	1,234.29	8,564.00	9,798.29	.....
Grant CA-04605-05	.....	18,026.69	11,233.45	6,793.24
Grant CA-04751-04	1,140.67	.....	1,140.67	.....
Grant CA-04751-05	725.33*	18,421.26	18,517.30	821.37*
Grant CA-04860-04	352.33	14,724.08	18,268.55	3,192.14*
Grant CA-04860-05	.....	4,710.00	3,346.36	1,363.64

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant CA-05507-02	6,448.63	.....	6,448.63	.....
Grant CA-05507-03	1,379.56	14,519.13	15,228.15	670.54
Grant CA-05507-04S1	.....	5,003.00	3,494.57	1,508.43
Grant CA-05509-03	3,722.09	10,960.00	14,682.09	.....
Grant CA-05509-04	.....	13,945.13	12,501.02	1,444.11
Grant CA-05634-03	951.66	12,569.00	13,520.66	.....
Grant CA-05634-04	.....	13,789.57	11,209.35	2,580.22
Grant CA-06452-02S1	6,621.58	8,235.00	20,724.89	5,868.31*
Grant CA-06452-03	.....	9,825.00	3,854.17	5,970.83
Grant CA-06580-01	22,572.68	.....	11,593.82	10,978.86
Grant CA-06580-02	.....	20,444.00	19,184.98	1,259.02
Grant CA-06691-01	31,000.00	.....	22,663.88	8,436.12
Grant CA-06786-01	6,477.67	.....	4,158.14	2,319.53
Grant CA-06911-01	25,130.12	19,671.00	44,801.12	.....
Grant CA-07136-01	2,068.08	6,339.00	8,090.04	317.04
Grant CA-07136-02	.....	4,228.00	1,625.84	2,602.16
Grant CA-07371-01	19.15*	13,582.00	13,562.85	.....
Grant CA-07371-02A1	.....	12,177.31	9,244.51	2,932.80
Grant CA-07387-01	.....	26,737.00	14,705.21	12,031.79
Grant CA-07401-01	.....	4,647.00	1,238.73	3,408.27
Grant CA-07580-01	.....	8,496.00	6,309.83	2,186.17
Grant 1-F2-CA-21, 388-01	.....	500.00	170.55	329.45
Grant 1-F3-CA-15, 387-01	.....	500.00	490.15	9.85
Grant T2-CA-542-16	.....	28,038.37	14,709.88	13,328.49
Grant 5-T4-CA-5042-05	9,464.76	49,013.66	58,257.78	220.64
Grant 5-T1-CA-5048-05	302.70*	8,100.00	3,601.16	4,196.14
Grant 5-T1-CA-5143-02	6,507.56	35,321.48	28,983.62	12,845.42
Grant 5-T1-CA-5143-03	.....	2,868.59	.....	2,868.59
Grant CH35-6A-63		59,081.46	51,509.51	7,571.95
Grant CPD-15387	65.74*	65.74	.....	.....
Grant CRT-5048-C2	.....	6,781.37	6,781.37	.....
Grant CRT-5048 (C3)	24,534.40	.....	24,534.40	.....
Grant CRT-5143	10,198.96	.....	10,198.96	.....
Grant CRTY-5042 (C3)	8,331.65	.....	7,910.06	421.59
Grant CSP-8520 (C2)	12.81*	12.81	.....	.....
Grant CT-542 (C14)	11,220.53	.....	11,220.53	.....
Grant CY4455 (C2)	845.11	.....	845.11	.....
Grant CY4860 (C2)	596.73	.....	596.73	.....
Grant CYP-3177 (C5)	.....	.....	140.87	140.87*
Grant D870 (C3)	1,000.51*	940.77	.....	59.74*
Grant D1382	.....	408.35	408.35	.....
Grant D1382 (C1)	480.93	.....	480.93	.....
Grant DE-01382-03S1	1,000.80	11,664.56	9,964.41	2,700.95
Grant DE-01382-04	.....	12,432.00	10,336.93	2,095.07
Grant DE-01750-01	2,477.82	.....	2,080.77	397.05
Grant DE-01899-01	.....	112,398.00	36,209.08	76,188.92
Grant DE-01859-02	.....	.....	2,706.24	2,706.24*
Grant 3-T1-DE-92-02S1	.....	53,486.99	30,238.14	23,248.85
Grant DT-92	17,911.24	.....	12,231.16	5,680.08
Grant E-1991 (C3)	12,153.05	.....	12,153.05	.....
Grant E-1999-C2	.....	213.01	213.01	.....
Grant 2E-31 (C4)	3,307.93	.....	1,126.80	2,181.13
Grant EPD-14680 (C1)	22.02	.....	1.69	20.33
Grant F-700 (C7)	77.21*	77.21	.....	.....
Grant FF-416	1,629.53	.....	1,629.53	.....
Grant FF-416-C1	.....	3,967.94	2,688.67	1,279.27
Grant FF-416-C2	.....	3,500.00	4,266.01	766.01*

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant FF-442	2,109.82	.....	2,109.82	.....
Grant FF-547	2,489.20*	9,161.00	6.671.80	.....
Grant FR-30-02	219,897.00	.....	92,852.12	127,044.88
Grant FR-00030-03	.....	50,000.00	170,238.89	120,238.89*
Grant FR-00111-01 & O1S1	.....	91,224.00	82,077.99	9,146.01
Grant 2G-233 (C2)	14,390.54	.....	14,390.54	.....
Grant 2G-51b (C2)	7,402.87	.....	7,148.18	254.69
Grant 2G-726 (C1)	7,355.78*	11,696.00	4,340.22	.....
Grant 2G-929	811.63	.....	811.63	.....
Grant 2G-1019	17,045.98	.....	6,711.30	10,334.68
Grant GM-0009-17	245.69	.....	245.69	.....
Grant GM-00091-18	3,712.84*	80,773.46	77,958.21	897.59*
Grant GM-00091-19	.....	.....	4,406.23	4,406.23*
Grant GM-04758-07	14,674.20	.....	14,674.20	.....
Grant GM-04758-08	.....	20,898.96	18,575.11	2,323.85
Grant GM-06242-04	1,375.40*	1,375.40	.....	.....
Grant GM-06242-05	1,407.68	39,630.58	42,492.28	1,454.02*
Grant GM-06242-06	.....	13,839.00	12,647.51	1,191.49
Grant GM-06628-04	7,853.60*	12,230.00	4,376.40	.....
Grant GM-06628-05	.....	26,573.00	25,210.69	1,362.31
Grant GM-06753-04	1,738.60	17,306.00	18,145.94	898.66
Grant GM-06753-05	.....	32,188.00	17,174.19	15,013.81
Grant GM-06912-03	12,311.99*	12,311.99	.....	.....
Grant GM-06912-04	8,356.23	30,465.71	30,688.40	8,133.54
Grant GM-06975-03	4,002.33	6,086.00	10,088.33	.....
Grant GM-07250-03	1,061.14	8,559.86	9,621.00	.....
Grant GM-07250-04A1	.....	16,242.09	10,487.62	5,754.47
Grant GM-07290-03	5,790.90	.....	5,790.90	.....
Grant GM-07290-04	3,018.30	18,652.00	13,396.49	8,273.81
Grant GM-07653-03	3,971.43*	10,821.08	6,849.65	.....
Grant GM-07653-04	.....	17,694.00	18,670.81	976.81*
Grant GM-08345-02	1,161.25	.....	1,161.25	.....
Grant GM-08345-03	2,577.53*	11,198.50	6,827.27	1,793.70
Grant GM-08345-04	.....	3,184.00	1,039.58	2,144.42
Grant GM-08702-02	20,720.23*	14,074.23	.....	6,646.00*
Grant GM-08803-02	2,784.43	.....	3,421.38	636.95*
Grant GM-08803-03	.....	15,391.00	11,935.28	3,455.72
Grant GM-09389-02	3,831.55	13,423.00	14,790.40	2,464.15
Grant GM-09389-03	.....	29,379.85	13,339.01	16,040.84
Grant GM-09730-02	2,501.93	13,681.16	15,518.35	664.74
Grant GM-09730-03	....	4,361.00	3,308.69	1,052.31
Grant GM-09767-02	806.42*	29,152.36	26,490.53	1,855.41
Grant GM-09767-03	.....	4,401.00	1,519.66	2,881.34
Grant GM-10287-01	13,128.01	.....	8,498.93	4,629.08
Grant GM-10287-02	.....	21,200.00	20,200.60	999.40
Grant GM-10317-01	11,552.41	.....	11,552.41	.....
Grant GM-10317-02	.....	33,069.73	21,397.79	11,671.94
Grant GM-10356-01	63,309.18	.....	52,829.64	10,479.54
Grant GM-10356-02	.....	112,679.00	108,507.36	4,171.64
Grant GM-10965-03	1,609.27	20,012.00	21,621.27	.....
Grant GM-10965-04	.....	21,868.69	17,477.06	4,391.63
Grant GM-11944-01A1	.....	11,000.00	10,987.86	12.14
Grant GM-17672-02	1,582.66	.....	1,678.89	96.23*
Grant GM-K3-1366 (C2)	1,624.38	91.52	1,715.90	.....
Grant GM-K3-3089 (C5) (B)	1,795.15	.....	770.16	1,024.99
Grant GM-K3-4385 (C2) (A)	4,042.64	.....	4,042.64	.....
Grant GM-K3-4385 (C2) (B)	1,089.56	.....	1,089.56	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant GM-K3-4416 (C3) (A)	24.42	.....	24.42	.....
Grant GM-K3-15184 (C3)	219.96*	219.96	.....	.....
Grant GM-K3-15184 (C3) (B)	224.27	.....	224.27	.....
Grant GM-K6-14222	85.50	.....	85.50	.....
Grant GM-R3-3089 (C5) (A)	1,129.85	.....	1,296.45	166.60*
Grant GN-5880 (C2)	7,187.72	.....	7,187.72	.....
Grant GPD-14316 (C1)	.07	.....	.07	.....
Grant GPD-15, 640	.....	500.00	499.09	.91
Grant GPD-16117	292.96	.....	292.96	.....
Grant GPD-18, 264	.....	500.00	496.18	3.82
Grant GPM-16483	2,286.84	.....	2,286.84	.....
Grant GPM-19189	2,947.87	.....	2,947.87	.....
Grant 1-F1-GM-20,685-01	.....	4,500.00	2,942.20	1,557.80
Grant 1-F1-GM-20,959-01	.....	4,500.00	4,337.30	162.70
Grant 1-F1-GM-21,168-01	.....	4,500.00	4,355.69	144.31
Grant 1-F1-GM-23,052-01	.....	1,668.00	2,574.53	906.53*
Grant 1-F1-GM-23,152-01	.....	4,334.00	1,453.49	2,880.51
Grant 1-F2-GM-17392-01A1	500.00*	500.00	.....	.....
Grant 1-F3-GM-20,713-01	.....	500.00	420.31	79.69
Grant 1-K3-GM-2341-01	.....	11,302.00	11,265.36	36.64
Grant 1-K6-GM-21,522-01	.....	13,909.00	14,958.54	1,049.54*
Grant 1-T1-GM-946-01	6,873.56	.....	6,336.00	537.56
Grant 1-T1-GM-1291-01	.....	.....	210.00	210.00*
Grant 2-F1-GM-23,103-01	.....	1,500.00	786.62	713.38
Grant 2-F2-GM-18,264-02	.....	375.00	154.67	220.33
Grant 2-K3-GM-4,416-06	.....	8,604.00	8,591.70	12.30
Grant 2-K3-GM-15,184-06	.....	4,114.00	4,034.80	79.20
Grant 2-T1-GM-726-04	.....	.....	.....	.....
Grant 5-F1-GM-15,893-02	.....	4,700.00	3,520.85	1,179.15
Grant 5-F1-GM-19,189-02	.....	5,200.00	2,906.51	2,293.49
Grant 5-F1-GM-20,959-02	.....	.....	500.20	500.20*
Grant 5-F1-GM-21,168-02	.....	.....	500.00	500.00*
Grant 5-F2-GM-16,117-02	.....	500.00	420.22	79.78
Grant 5-K3-GM-1366-04	.....	20,001.00	18,395.18	1,605.82
Grant 5-K3-GM-3089-07	.....	3,652.00	1,209.87	2,442.13
Grant 5-K3-GM-4385-04	.....	25,578.00	21,354.32	4,223.68
Grant 5-K3-GM-4416-05	3.94	7,480.00	8,538.50	1,054.56*
Grant 5-K3-GM-15184-05	25.51*	11,214.00	11,212.82	24.33*
Grant 5-K6-GM-14,222-02	.....	22,738.00	22,606.30	131.70
Grant 5-T1-GM-233-04	.....	117,154.85	114,809.91	2,344.94
Grant 5-T1-GM-516-04	.....	100,136.00	88,144.51	11,991.49
Grant 5-T1-GM-726-03	.....	26,281.18	16,855.48	9,425.70
Grant 5-T1-GM-929-02	.....	45,649.11	42,618.54	3,030.57
Grant 5-T1-GM-1019-02	.....	71,845.00	37,134.84	34,710.16
Grant H-2788 (C4)	20.29	.....	20.29	.....
Grant H-3476 (C4)	848.90	.....	556.22	292.68
Grant H-3549 (C4)	59,221.07	.....	59,221.07	.....
Grant H-4206 (C2)	132.00	.....	.....	132.00
Grant H-4416 (C2)	3,699.77	.....	3,699.77	.....
Grant H-4807 (C1)	.....	71.25	71.25	.....
Grant H-5019 (C2)	56.27	.....	56.27	.....
Grant H-5640 (C1)	376.76	.....	376.76	.....
Grant H-5804 (C1)	1,149.80	.....	1,149.80	.....
Grant H-6381	.....	4.17	4.17	.....
Grant H-6947 (C1)	5.00*	171.49	166.49	.....
Grant H-6960	116,345.55	.....	12,640.79	103,704.76
Grant H-7061	1,038.33	.....	1,038.33	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant HD-00078-01	.....	16,386.00	6,153.19	10,232.81
Grant HD-00366-01	5,054.66	17,352.00	19,901.86	2,504.80
Grant HD-00366-02	.....	.....	978.52	978.52*
Grant HD-00668-06	1,942.37*	177,514.00	172,168.33	3,403.30
Grant HD-00668-07	.....	270,984.00	185,548.55	85,435.45
Grant HD-01165-08	.....	5,243.00	1,305.30	3,937.70
Grant HD-01200-05	.....	8,493.00	11,288.03	2,795.03*
Grant HD-01269-02S1	.....	19,934.67	16,872.45	3,062.22
Grant HE-00763-12	6,156.60	12,693.00	14,024.52	4,825.08
Grant HE-00763-13	.....	8,921.08	3,612.70	5,308.38
Grant HE-01226-12	6,598.39*	9,200.00	2,601.61	.....
Grant HE-01226-13	.....	18,695.11	13,936.43	4,758.68
Grant HE-01782-09	16,548.87*	15,749.01	.....	799.86*
Grant HE-01782-10S1	.....	44,576.00	52,206.31	7,630.31*
Grant HE-02170-08	6,120.03	.....	6,120.03	.....
Grant HE-02170-09	.....	17,926.39	13,965.11	3,961.28
Grant HE-02228-08	1,597.23	12,126.00	13,723.23	.....
Grant HE-02228-09	.....	51,939.19	33,749.52	18,189.67
Grant HE-02624-07	3,405.88	.....	3,096.58	309.30
Grant HE-02759-07	3,753.09	5,294.00	9,047.09	.....
Grant HE-02759-08	.....	6,204.76	8,372.85	2,168.09*
Grant HE-03028-06	8,173.49	.....	10,759.87	2,586.38*
Grant HE-03028-07	.....	18,288.70	6,773.39	11,515.31
Grant HE-03371-06	2,070.02	.....	662.21	1,407.81
Grant HE-03549-06	1,525.65*	9,923.89	8,398.24	.....
Grant HE-03549-07	.....	14,731.91	19,163.62	4,431.71*
Grant HE-03997-03	2,665.75*	6,308.55	3,642.80	.....
Grant HE-04416-04	5,439.92	9,759.77	8,228.03	6,971.66
Grant HE-04702-04	2,198.65	7,562.00	19,760.65	.....
Grant HE-04702-05	.....	23,816.57	17,441.29	6,375.28
Grant HE-04807-03	13,327.60	.....	13,327.60	.....
Grant HE-04807-04	.....	59,162.63	52,008.24	7,154.39
Grant HE-05640-03	5,148.54	376.76	3,276.32	2,248.98
Grant HE-05875-03	8,625.43	14,526.00	20,179.01	2,972.42
Grant HE-05875-04	.....	14,528.00	13,839.97	688.03
Grant HE-05900-02	914.15	.....	914.15	.....
Grant HE-05900-03	3,130.00	10,338.97	13,468.97	.....
Grant HE-06146-02	702.35	.....	702.35	.....
Grant HE-06146-03	3,381.90	13,654.65	9,646.91	7,389.64
Grant HE-06146-04	.....	4,211.00	1,866.34	2,344.66
Grant HE-06381-02	7,184.04*	9,890.00	2,705.96	.....
Grant HE 06381-03	.....	23,149.41	28,166.84	5,017.43*
Grant HE-06400-02	8,826.74	13,420.00	22,246.74	.....
Grant HE-06400-03	.....	38,567.34	22,044.66	16,522.68
Grant HE-06947-03	5,555.15	5,880.00	11,411.67	23.48
Grant HE-07061-02	3,523.52	16,657.09	21,911.54	1,730.93*
Grant HE-07061-03	.....	4,239.00	2,414.31	1,824.69
Grant HE-07369-02	3,218.79*	11,610.00	8,391.21	.....
Grant HE-07369-03	.....	22,051.03	16,960.57	5,090.46
Grant HE-07563-01	32,383.04	.....	32,557.61	174.57*
Grant HE-07563-02S1	.....	111,150.01	98,532.69	12,617.32
Grant HE-07780-01	11,670.32	12,978.00	24,648.32	.....
Grant HE-07780-02	.....	12,197.88	6,680.11	5,517.77
Grant HE-07803-01	14,627.43	45,429.00	50,646.32	9,410.11
Grant HE-07868-01	17,450.61	6,654.00	18,706.07	5,398.54
Grant HE-07868-02	.....	13,103.00	13,746.85	643.85*
Grant HE-07896-01	178,034.20	196,978.00	375,029.77	17.57*

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant HE-07896-02S1	.....	470,719.24	53,914.94	416,804.30
Grant HE-08421-01	.....	23,812.98	18,432.07	5,380.91
Grant HE-08487-01	1,502.96*	5,823.00	4,322.23	2.19*
Grant HE-08550-01	.....	6,150.00	9,142.10	2,992.10*
Grant HE-08571-01	.....	.....	14.85	14.85*
Grant HE-08620-01	.....	14,201.00	14,235.34	34.34*
Grant HE-08667-01	.....	34,754.00	14,761.19	19,992.81
Grant HE-K3-17,923	367.53	.....	367.53	.....
Grant HE-K6-14,188-R1	249.76	.....	249.76	.....
Grant 1-F2-HE-19,525-01	.....	500.00	500.00	.....
Grant 1-F2-HE-19,613-01	.....	500.00	497.70	2.30
Grant 1-F2-HE-19,619-01	.....	500.00	391.01	108.99
Grant 1-F2-HE-20,063-01	.....	500.00	436.91	63.09
Grant 1-F2-HE-20,429-01	.....	500.00	965.83	465.83*
Grant 1-F2-HE-21,118-01	.....	500.00	541.19	41.19*
Grant 2-F2-HE-14,743-03	.....	500.00	519.19	19.19*
Grant 5 F2-HE-17,915-02	176.80	.....	620.05	443.25*
Grant 7-F2-HE-17,640-02	204.35	.....	204.35	.....
Grant 5-K3-HE-17,923-02	.....	15,741.20	15,357.05	384.15
Grant 5-K6-HE-14,188-02	.....	28,981.20	28,619.46	361.74
Grant 1-T1-HE-5604-01	.....	25,471.00	26,797.96	1,326.96*
Grant 3-T1-HE-5284-05S1	.....	20,751.32	16,183.30	4,568.02
Grant 5-T1-HE-5219-04	128.08	28,675.08	19,390.18	9,412.98
Grant 5-T1-HE-5369-05	.....	106,422.79	105,792.24	630.55
Grant 5-T1-HE-5372-05	46.73	27,772.41	20,545.45	7,273.69
Grant 5-T1-HE-5372-06	.....	.....	315.30	315.30*
Grant 5-T1-HE-5478-03	.....	31,304.00	22,645.71	8,658.29
Grant 5-T2-HE-257-15	.....	25,005.40	26,239.19	1,233.79*
Grant HP-7369	8,441.80	1,885.20	10,327.00	.....
Grant HPD-14,743-01	283.08	.....	283.00	.08
Grant HPD-15,803	358.39	.....	357.48	.91
Grant HPD-17669	4.51	.....	.....	4.51
Grant HSF-934 (C1)	500.00	.....	500.00	.....
Grant HSP-14,261-C1	.....	500.00	500.00	.....
Grant HT-257 (C13)	1,494.41	343.23	1,837.64	.....
Grant HTS-5219 (C2)	9,178.00	.....	9,178.00	.....
Grant HTS-5284 (C3)	6,798.77*	6,798.77	.....	.....
Grant HTS-5369 (C3)	5,658.49	.....	5,658.49	.....
Grant HTS-5372 (C3)	2,696.16	.....	2,696.16	.....
Grant HTS-5478 (C1)	12,899.53	.....	5,355.62	7,543.91
Grant K3-4416 (C3) (B)	189.07	.....	189.07	.....
Grant M-5356	1,599.96*	1,599.96	.....	.....
Grant M-6022	811.19	.....	811.19	.....
Grant 2M-5077 (C14)	6,117.05	.....	2,012.29	4,104.76
Grant 2M-5077 (C15)	11,508.29	.....	10,095.15	1,413.14
Grant 2M-5972 (C9)	5,324.55*	16,388.00	11,063.45	.....
Grant 2M-6144 (C8)	5,477.96	.....	5,365.53	112.43
Grant 2M-6427 (C4)	3,034.14	.....	3,034.14	.....
Grant 2M-6427 (C5)	365.62*	585.20	219.58	.....
Grant 2M-6985 (C2)	11,894.78*	13,030.00	1,135.22	.....
Grant 2M-7073 (C2)	382.91	.....	382.91	.....
Grant 2M-7105 (C3)	1,714.32	.....	1,714.32	.....
Grant 2M-7435	.....	205.60	205.60	.....
Grant 2M-7435 (C1)	1,785.76	.....	1,785.76	.....
Grant 2M-7823	1,478.00	.....	1,478.00	.....
Grant 2M-7957	5,274.48	.....	5,274.48	.....
Grant 2M-8000	289.31	.....	289.31	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant MF-5787 (C1)	24.18*	.....	.....	24.18*
Grant MF-17490	150.84	.....	.....	150.84
Grant MH-00900-09	9,609.54*	10,404.00	542.06	252.40
Grant MH-01468-01	.....	13,540.00	2,879.93	10,660.07
Grant MH-3917-03	7,298.00	.....	7,298.00	.....
Grant MH-03917-04	2,198.76	25,065.14	27,525.01	261.11*
Grant MH-03917-05	.....	8,100.00	6,320.66	1,779.34
Grant MH-04453-04	.....	17,630.00	5,801.83	11,828.17
Grant MH-04849-02	19,325.42*	20,079.94	754.52	.....
Grant MH-04849-03	7,782.28*	55,668.52	47,433.79	452.45
Grant MH-04849-04	.....	9,454.00	6,608.69	2,845.31
Grant MH-05356-02	11,392.58	.....	11,392.58	.....
Grant MH-05356-03	.....	27,732.46	14,340.93	13,391.53
Grant MH-06022-02	1,749.93	11,030.71	11,842.50	938.14
Grant MH-06022-03	.....	3,570.00	2,316.73	1,253.27
Grant MH-06529-01	1,603.31	.....	1,603.31	.....
Grant MH-06661-01	8,965.70	.....	8,503.15	462.55
Grant MH-06661-02	578.36*	19,820.00	15,850.73	3,390.91
Grant MH-06661-03	.....	.....	834.51	834.51*
Grant MH-07465-01	386.57*	5,808.00	5,012.41	409.02
Grant MH-07465-02	.....	1,452.00	1,145.68	306.32
Grant MH-07898-01	3,665.19	.....	3,171.84	493.35
Grant MH-07989-01	.....	7,434.00	6,713.53	720.47
Grant MH-08090-01	.....	12,400.00	11,605.47	794.53
Grant MH-08090-02	.....	.....	333.33	333.33*
Grant MH-08244-01	.....	8,695.00	7,724.38	970.62
Grant MH-08351-01	.....	6,924.00	2,567.84	4,356.16
Grant MH-08483-01	.....	11,464.00	37.64	11,426.36
Grant MH-09186-01	2,842.35*	67,002.00	29,854.77	34,304.88
Grant 1-F1-MH-20,438-01	.....	5,200.00	3,874.04	1,325.96
Grant 1-F1-MH-20,546-01	.....	4,500.00	3,262.71	1,237.29
Grant 1-F1-MH-20,752-01	.....	4,700.00	3,166.31	1,533.69
Grant 1-F1-MH-21,029-01	.....	4,700.00	3,603.97	1,096.03
Grant 1-F1-MH-24,357-01	.....	.....	985.00	985.00*
Grant 4-F1-MH-20,438-02	.....	.....	500.00	500.00*
Grant 5-F1-MH-13,934-02	75.20*	5,700.00	4,432.25	1,192.55
Grant 5-F1-MH-20,546-02	.....	.....	500.00	500.00*
Grant 5-F3-MH-5787-02	394.97	.....	392.62	2.35
Grant 5-F3-MH-5787-03	.....	500.00	324.81	175.19
Grant 5-F3-MH-18,193-02	500.00	.....	494.51	5.49
Grant 1-T1-MH-8045-01	.....	39,596.00	33,841.81	5,754.19
Grant 5-T1-MH-5077-17	.....	103,879.68	93,916.40	9,963.28
Grant 5-T1-MH-6144-10	.....	70,277.00	58,948.73	11,328.27
Grant 5-T1-MH-6985-04	.....	41,709.54	36,023.73	5,685.81
Grant 5-T1-MH-7073-04	.....	33,141.58	23,430.39	9,711.19
Grant 5-T1-MH-7105-05	.....	49,351.58	47,977.87	1,373.71
Grant 5-T1-MH-7823-02	.....	41,266.04	29,653.39	11,612.65
Grant 5-T1-MH-7957-02	.....	68,225.62	50,721.57	17,504.05
Grant 5-T1-MH-8000-02	.....	16,794.00	14,015.31	2,778.69
Grant 5-T2-MH-5972-11	.....	34,556.91	23,098.96	11,457.95
Grant 5-T2-MH-6427-07	.....	27,765.94	21,940.74	5,825.20
Grant 5-T2-MH-7435-03	.....	24,126.20	20,190.93	3,935.27
Grant 6-F1-MH-15,882-01A1	.....	5,200.00	3,832.46	1,367.54
Grant K3-MH-5153-01	.....	18,730.00	18,549.86	180.14
Grant K3-MH-19,523-01	2,323.60*	18,280.00	14,681.89	1,274.51
Grant K3-MH-19,523-02	.....	4,687.00	2,593.69	2,093.31
Grant F2-MH-21,584-01	.....	500.00	156.41	343.59

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant MPD-17,377-C1	10.40	.....	10.40	.....
Grant MPM-13,934-R1	403.80	.....	197.23	206.57
Grant MPM-14,873-C1	.....	500.00	267.24	232.76
Grant MPM-14,873-01	1,480.67	.....	1,329.50	151.17
Grant MPM-18,570	442.06	.....	356.47	85.59
Grant MR-04453-03	5,588.60	12,246.00	17,852.09	17.49*
Grant N-3503A64 (T)	.....	5,225.00	13,255.90	8,030.90*
Grant N-3506-A-64	.....	3,904.00	.....	3,904.00
Grant NBI-EP-1-F2-19,756-01	344.71*	.....	970.30	1,315.01*
Grant NBI-EP-BF 6336 (C3)	31.51	.....	31.51	.....
Grant NBI-EP-BPD-6336 (C4)	320.71	.....	320.71	.....
Grant NBI-EP-5-K6-NB-16,677-02	.....	14,979.00	15,123.30	144.30*
Grant 2F2-NB-19,756-02	.....	500.00	.....	500.00
Grant 2-T1-NB-5212-06	.....	.....	113.63	113.63*
Grant 5-T1-NB-5212-05	.....	52,712.98	36,412.79	16,300.19
Grant 5-T1-NB-5232-05	.....	58,914.00	56,603.23	2,310.77
Grant 5-T1-NB-5358-03	.....	29,065.11	18,773.24	10,291.87
Grant 5-T1-NB-5358-04	.....	.....	180.00	180.00*
Grant 1-T1-NB-5417-01	.....	35,858.00	33,749.51	2,108.49
Grant NB-0669-11S1	.....	.....	1,170.52	1,170.52*
Grant NB-00669 (09)	452.58	.....	452.58	.....
Grant NB-00669-10	812.01*	15,139.15	11,902.30	2,424.84
Grant NB-01161-07	279.80	5,053.97	5,133.77	200.00
Grant NB-01161-08	.....	5,245.00	4,228.55	1,016.45
Grant NB-02365-06	4,737.10	.....	4,737.10	.....
Grant NB-01365-07S1	699.16*	24,702.61	24,502.49	499.04*
Grant NB-02369-07	763.48	6,102.00	6,865.48	.....
Grant NB-02369-08	.....	4,019.64	1,167.28	2,852.36
Grant NB-02434-04	311.35*	.....	40.93	352.28*
Grant NB-02793-03	2,231.26*	9,312.00	7,080.74	.....
Grant NB-02793-04	.....	9,984.59	9,575.87	408.72
Grant NB-03261-02	1,421.27	.....	1,421.27	.....
Grant NB-03261-03	2,544.80	.....	2,572.61	27.81*
Grant NB-03437-02	5,130.81	10,000.00	15,734.05	603.24*
Grant NB-03437-03	.....	25,174.00	10,574.62	14,599.38
Grant NB-03670-03	1,222.16*	41,164.59	30,528.23	9,414.20
Grant NB-03670-04	.....	.....	1,286.21	1,286.21*
Grant NB-03799-02	1,551.34	.....	1,186.66	364.68
Grant NB-03897-02	2,212.12	11,900.28	11,096.66	3,015.74
Grant NB-03897-03	.....	3,020.00	1,188.69	1,831.31
Grant NB-04368-01	9,031.67	9,082.00	16,211.90	1,901.77
Grant NB-04368-02	.....	5,310.00	6,630.96	1,320.96*
Grant NB-04793-01	.....	19,591.00	13,744.50	5,846.50
Grant NB-05148-01	.....	33,089.00	28,538.28	4,550.72
Grant NB-19,756-01	500.00	.....	.....	500.00
Grant NB-K6-16677	224.32*	14,296.00	13,589.89	481.79
Grant NT-11-06	2,599.99	.....	2,599.99	.....
Grant NT-11-07	.....	23,422.00	18,512.20	4,909.80
Grant NU-00028-03	.....	10,200.00	2,915.28	7,284.72
Grant NU-00085-01	.....	32,523.00	21,506.19	11,016.81
Grant RG-91 (C15)	220.00	.....	.....	220.00
Grant RG-5509 (C4)	14.59	.....	14.59	.....
Grant RG-6975 (C1)	132.00	.....	132.00	.....
Grant RG-7250 (C1)	1,382.14	.....	1,382.14	.....
Grant RG-8670	1,155.87	.....	1,107.87	48.00
Grant RG-8823	227.48	.....	227.48	.....
Grant RG-9730	1,122.35	.....	1,122.35	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant RG-9767	1,676.19	.....	1,676.19	.....
Grant WP-316	1,477.73	.....	1,477.73	.....
Grant WP-00316-02	3,335.00	10,870.51	11,364.16	2,841.15
Grant WP-00316-03	.....	3,335.00	.....	3,335.00
Total Governmental	$1,168,371.35	$12,107,012.35	$12,227,012.95	$1,048,370.75
Abbott Laboratories Grant to Dr. R. F. Becker	$	$ 2,250.00	$ 1,814.30	$ 435.70
Abbott Laboratories Grant DA-759	6,540.85	8,400.00	9,020.92	5,919.93
Accounting Faculty Discretionary Fund	695.97	400.00	691.20	404.77
George Garland Allen Memorial Fund	25,123.21	1,000.00	.....	26,123.21
Air Force Basic Cadet Fund	4,328.92	4,922.50	5,253.97	3,997.45
Allied Chemical Corporation:				
Fellowship	14.51*	748.51	734.00	.....
Grant to Dr. L. A. Bigelow	417.33	159.53	576.86	.....
American Academy of Pediatrics Grant to Dr. Alexander Spock	.....	4,000.00	.....	4,000.00
American Cancer Society:				
Grant E-84A	5,243.26	.....	5,243.26	.....
Grant E-84B	.....	27,640.00	22,467.26	5,172.74
Grant E-213A	1,618.70	.....	1,618.29	.41
Grant E-213B	.....	10,637.00	8,919.67	1,717.33
Grant E-238A	1,080.00	.....	1,080.00	.....
Grant IN-61C	14,957.82	.....	14,957.82	.....
Grant IN-61D	.....	25,000.00	14,237.78	10,762.22
Grant P-166	58.46	.....	.....	58.46
Grant P-166D	4,811.05	7,353.15	12,164.20	.....
Grant P-166E	.....	7,374.00	3,476.91	3,897.09
Grant P-221B	4,763.11*	5,634.00	870.89	.....
Grant P-221C	.....	6,477.00	8,106.60	1,629.60*
Grant P-354	.....	5,922.00	7,710.69	1,788.69*
Grant P-358	.....	19,687.00	19,062.00	625.00
Grant PF-219	.....	200.00	182.32	17.68
Grant T-237	78.46	.....	78.46	.....
Grant T-237A	2,366.87	.....	2,366 87	.....
Grant T-237B	.....	18,859.00	18,559.87	299.13
Grant T-251	1,445.10*	7,189.98	5,744.88	.....
Grant T-251A	.....	41,654.00	36,373.06	5,280.94
American Chemical Society Grant PRF-409-A	7,847.85	.....	7,120.72	727.13
American Cyanamid Company Faculty Support Grant	4,066.44	3,500.00	3,216.29	4,350.15
American Diabetes Association Grant to Dr. Frank L. Engel	208.73	.....	208.73	.....
American Heart Association:				
Grant #59-G9-1963	43.79*	43.79	.....	.....
Grant #59-G9-1964	.....	4,290.00	4,525.22	235.22*
Grant #60-G134	212.98	.....	212.98	.....
Grant #62-G173	669.21	.....	669.21	.....
Grant #63-G127-1964	.....	5,225.00	4,510.39	714.61

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant to Dr. Samuel J. Friedberg	9.54*	1,020.39	1,010.85	.....
Grant to Dr. Henry McIntosh	.....	3,922.23	3,620.49	301.74
American Historical Association Grant	.....	4,272.00	4,272.00	.....
American Tobacco Company Chemistry Research Grant	.....	22,000.00	8,483.19	13,516.81
Ananase Study of Dr. Frank Bassett Fund	.....	5,000.00	4,976.68	23.32
Anatomy Department Fund	.....	5,000.00	.....	5,000.00
Anatomy Department Postgraduate Fund	1,073.69	4,482.50	2,728.92	2,827.27
Anesthesia and Surgical Appliance Research Fund	3,563.34	202.36	1,317.21	2,448.49
W. G. Anlyan Research Fund	.....	3,305.40	453.40	2,852.00
Approved Supply Pastors' School Fund	8,454.70	24,753.90	25,730.23	7,478.37
Art Center Building Fund	407,593.91	28,671.87	.....	436,265.78
Art Collection Fund	427.34	170.00	.....	597.34
Arthritis and Rheumatism Foundation Fellowship to Robert Cherniak	461.82	40.92	458.96	43.78
Asia Foundation:				
Grant to Asrav Hussein	.....	2,267.00	1,907.00	360.00
Grant to Dr. Hwa Wen Lai	280.00	1,483.00	1,763.00	.....
Associates of the Trent Collection Fund	589.83*	1,588.50	695.69	302.98
Atomic Energy Commission Contract AT-(40-1)-3065 Supplemental Fund	.....	11,085.79	.....	11,085.79
Ayerst Laboratories:				
Grant to Division of Anesthesiology	2,507.92	7,550.00	4,255.24	5,802.68
Babcock Foundation World Rule of Law Fund	26,909.58	30,107.12	23,964.25	33,052.45
John S. Bassett Lecture Series Fund	.....	2,101.13	937.25	1,163.88
Baxter Laboratories, Inc. Pyromen Studies Fund	8.29	.....	8.29	.....
George Baylin Radiology Research Fund	121.87	.....	106.41	15.46
Dorothy Beard Research Fund	157,763.17	6,367.47	4,008.05	160,122.59
Bell Telephone Laboratory Grant to the Department of Electrical Engineering	6,712.50	14,380.00	3,059.56	18,032.94
Mary Duke Biddle Foundation:				
Art Center Consultation Fund	3,316.05	6,889.43	13,434.31	3,228.83*
Art Center Planning Consultation Fund	6,406.34	22,515.00	25,406.56	3,514.78
Art Exibit Fund	1,357.35	12,500.00	12,129.03	1,728.32
Department of Anatomy Fund	1,155.05	.....	500.00	655.05
Division of Urology Fund	49,478.61	58,580.00	22,635.03	85,423.58
Grant to Art Department	.....	8,000.00	3,920.36	4,079.64
Grant to Department of Psychology	.....	8,000.00	6,000.00	2,000.00
Grant to the Sarah P. Duke Gardens	23,101.54	.....	1,866.06	21,235.48
Grant to the D. U. Library	190.76	2,000.00	125.00	2,065.76
Grant to the D. U. Medical Center Library	2,053.34	8,900.00	7,343.17	3,610.17
Grant to the D. U. Religious Council	700.00	.....	.....	700.00
Grant to the Hanes Committee	1,000.00	.....	.....	1,000.00
Grant for Health Team Fund	80.35*	80.35	.....	.....
Grant to Angus McBryde	206.87*	206.87	.....	.....
Grant to Dr. Blaine Nashold	1,226.14	77.62	1,291.76	12.00
Grant to Nursing School—Nurse in Surgical Techniques for Specialties	.....	5,000.00	.....	5,000.00
Grant to Dr. Galen W. Quinn	730.45	.....	709.41	21.04
Grant for Research and Service in Sterility Fund	4,869.96	205.46	5,075.42	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant for Television Laboratory Equipment to Dr. Madison Spach	11,500.00	.....	11,500.00	.....
Medical Library Fund	648.61	30,000.00	14,498.62	16,149.99
Medical Library Planning Consultants Fund	10,096.30*	.....	.....	10,096.30*
Music Lectureships Fund	50.00	14.80	64.80	.....
Patient Education Fund	4,587.88	400.00	4,250.35	737.53
Professorship in Music Fund	48,215.36	19,200.00	61,885.46	5,529.90
Biennial Polymer Symposium for Chemistry Fund	.....	.....	990.35	990.35*
Biochemistry Department Fund	1,244.39	451.64	242.28	1,453.75
William Blackhurn Project Fund	100.00	.....	100.00	.....
Borden Undergraduate Award in Medicine Fund	3,020.30	.....	500.00	2,520.30
Botany Department Equipment Fund	4,000.00	.....	3,922.65	77.35
Botany Department Fund	.....	806.17	320.00	486.17
Earl & Blanche Brian Research in Leukemia Fund	1,799.27	42.10	1,841.37	.....
Bristol Lahoratory Grant to Dr. Suydam Osterhout	.....	4,100.00	.....	4,100.00
Frank C. Brown Folklore Collection Fund	1,970.98	.....	515.09	1,455.89
Brunswick Pulp and Paper Company Fellowship for Hardwood Silviculture Research Fund	864.97	1,250.00	1,000.00	1,114.97
CBS Foundation, Inc. Ohstetrics Fund	5.51*	5.51	.....	.....
California Research Corporation Grant to Dr. Walter Gordy	162.76	.....	.....	162.76
Cardiopulmonary Research Fund	1,541.93	.....	560.54	981.39
Cardiovascular Research Fund	2,891.36	7,660.32	9,708.01	843.67
Carlyle Letter Book Fund	.....	7,500.00	.....	7,500.00
Carnegie Corporation:				
Commonwealth Studies Fund	114,002.23	65,824.26	29,878.32	149.948.17
Soviet International Law Doctrine Fund	13,000.00	13,000.00	10,221.10	15,778.90
Catalogue for the Trent Collection Fund	1,586.47	.....	35.10	1,551.37
Catechol Amine Research Fund	5,173.11	6,781.82	6,276.67	5,678.26
Check List for Scientific Periodicals Fund	46.73	.....	.....	46.73
Chemistry Department Portrait Fund	.....	915.00	.....	915.00
Chemistry Department Library Fund	230.87	.....	1.76	229.11
Chemstrand Corporation—Chemistry Fund	500.00	.....	168.02	331.98
Chemstrand Research Grant to Dr. W. R. Krighaum	1,556.01	.....	1,408.79	147.22
China Medical Board Grant for Microhiology	203.85	.....	.....	203.85
Choral Music Fund	4,047.88	2,500.00	3,647.87	2,900.01
Christian Convocation Fund	540.01	1,568.00	2,082.43	25.58
Ciha Pharmaceutical Products, Inc.:				
Grant to Dr. Ivan Brown	2.52	.....	.....	2.52
Grant to Division of Anesthesia	335.54	.....	335.54	.....
Grant to Dr. Henry McIntosh	584.62	2,037.66	2,622.28	.....
Grant to Dr. R. R. Rohinson & Dr. J. C. Gunnells	.....	5,000.00	5,000.00	.....
Hypertension Research Fund	4,683.99	.....	2,339.42	2,344.57
Clinical Chemistry Fund	4,536.28	16,856.81	9,965.78	11,427.31
T. S. Coile Forestry Research Fund	177.27	400.00	420.80	156.47

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Cold Spring Harbor Laboratory Fund	25,000.00	.....	.....	25,000.00
Buddy Cole Memorial Fund for Children's Diseases	2,763.60	100.00	885.16	1,978.44
Commonwealth Fund:				
Experimental Training Program	72,542.04	.....	52,368.17	20,173.87
Fellowship to J. B. Wyngaarden	13,735.47	.....	13,011.07	724.40
Compton Rule of Law Fund	13,267.07	67.01	9,212.95	4,121.13
Conference of the Ministry Fund	.....	2,376.50	2,026.28	350.22
Conference Soviet Impact on International Law Fund	.....	4,080.50	4,064.13	16.37
Continuous Forest Inventory Pool Fund	562.00	.....	.....	562.00
Coordinated Rehabilitation Research Fund	10,982.93	11,535.00	13,050.14	9,497.79
Cosmetic Prosthetic Restoration Revenue Fund	402.00	3,009.00	.....	3,411.00
Council for Tobacco Research:				
Grant to Dr. R. F. Becker	.....	15,000.00	4,942.55	10,057.45
Grant to Dr. H. D. McIntosh	.....	11,280.00	5,394.21	5,885.79
Crippled Children's Spastic Orthopedic Fund	26,651.52	.....	.....	26,651.52
Cutter Laboratories Plasmanate Research Fund	469.28	340.01	10.00	799.29
Cystic Fibrosis Fund	1,405.00	408.05	1,508.05	305.00
Carl Henry Davis Memorial Film Collection Fund	4,100.00	.....	.....	4,100.00
Department of Surgery Fund	501,211.90	280,356.15	193,883.49	587,684.56
Dermatology Research Fund	17,506.17	2,000.00	9,845.74	9,660.43
Dining Halls Betterment Fund	45,320.25*	33,010.30	.....	12,309.95*
Disarmament Treaties and Individual Violations Fund	2,183.87	.....	2,183.87	.....
Divinity School Coordinating Council Fund	.....	1,200.00	721.05	478.95
Divinity School Discretionary Fund	.....	5,116.08	.....	5,116.08
Divinity School Fund	5,293.74	10,103.88	8,403.67	6,993.95
Divinity School Summer Clinic Fund	2,123.70	5,376.00	4,472.40	3,027.30
Doctoral Dissertation Microfilming Fund	3,741.62	3,104.41	3,128.46	3,717.57
Dreyfus Foundation Grant to Chemistry Department	2,786.63	.....	2,643.45	143.18
Duke Chapter Student American Medical Association Fund	2,402.00	.....	194.00	2,208.00
Duke Divinity School Building Fund	15,770.00	12,958.70	.....	28,728.70
Duke Endowment:				
Grant #30-Consultants Fund	.....	130,225.50	20,432.85	109,792.65
Grant #32-Professorship Fund	11,469.00	.....	25,770.48	14,301.48*
Grant #34-Institutional Advancement Office	.....	35,324.41	35,324.41	.....
Grant #36-Faculty Salary Improvements	.....	36,184.00	36,184.00	.....
Grant #37-Library Addition	.....	1,524,640.59	75,000.00	1,449,640.59
Grant #38H-Discretionary Fund	25,000.00	.....	4,268.93	20,731.07
Grant #38N-Oceanographic Vessel	.....	61,157.00	.....	61,157.00
Grant #38o-Engineering Faculty	.....	100,882.38	62,368.71	38,513.67
Grant #40-Physics Building Addition	.....	451,191.92	200,000.00	251,191.92
Grant #41-Divinity School Renovation	.....	456,758.29	50,000.00	406,758.29

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Grant #42-Art Center Building	.....	508,645.82	.....	508,645.82
Grant #43-Laundry Building	.....	215,459.77	114,983.00	100,476.77
Grant #44-President's Residence	.....	61,857.00	61,857.00	.....
Grant #45-Development Campaign	87,662.50	69,306.79	157,121.40	152.11*
Grant for Eye Study Project	.....	25,000.00	436.67	24,563.33
Grant for Medical Center Planning Fund	1,634.19*	16,186.81	3,205.50	11,347.12
Health Planning Council Fund	.....	5,000.00	5,000.00	.....
Duke Forest Fund	49,354.93	.....	.....	49,354.93
Doris Duke Foundation:				
Children's Teaching Program Grant	1,025.97	46.52	1,072.49	.....
Grant to Department of Ophthalmology	1,317.80	500.00	.....	1,817.80
Pediatrics Study Fund	9,353.56	.....	.....	9,353.56
Professorship Fund	149,412.00	.....	15,648.00	133,764.00
Teaching Program in Infectious Diseases	2,347.26	.....	1,553.10	794.16
Unrestricted Gift Fund	33,315.31	.....	.....	33,315.31
Duke Poison Control Center Fund	1,322.84	.....	1,322.84	.....
Duke Hospital Chapel Fund	4,532.45	5,028.50	.....	9,560.95
Duke Hospital Social Service Fund	80,025.45	.....	29,052.46	50,972.99
Duke Medical Student Government Association Fund	5,218.70	.....	1,500.00	3,718.70
Duke Memorial Etching Fund	168.67	198.00	.....	366.67
Benjamin N. Duke Professorship in Art Fund	20,701.54	10,000.00	12,570.72	18,130.82
Duke University Conference on Teaching Social Studies Fund	.....	2,505.80	2,320.78	185.02
Duke University Development Fund	290.00	.....	.....	290.00
Duke University Memorial Fund	.....	908.12	.....	908.12
Duke University Plate Fund	1,420.70	1,490.40	65.54	2,845.56
DuPont, E. I. de Nemours & Company:				
Anesthesia Grant	469.63*	1,220.23	750.60	.....
Grant for Advancing Undergraduate Teaching	9,490.79	5,000.00	7,336.81	7,153.98
Grant for Fundamental Research in Chemistry Fund	8,644.87	5,000.00	6,711.72	6,933.15
Postgraduate Fellowship in Chemistry Fund	2,697.04	2,660.00	2,666.04	2,691.00
Postgraduate Fellowship in Physics Fund	3,660.14	.....	2,906.82	753.32
Durham Cerebral Palsy Foundation Grant to Dr. Leonard Goldner	54.59	1,000.00	37.74	1,016.85
Durham County History Project Fund	200.00	.....	.....	200.00
Eastman Kodak Company Research Grant	5,750.00	625.00	3,884.99	2,490.01
E. E. G. Laboratory Account Fund	11,755.59	30,672.45	31,832.78	0,595.26
E. E. G. Symposium Fund	1,010.02	.....	460.24	549.78
Electrical Engineering Department Fund	.....	1,000.00	.....	1,000.00
Electronics Shop Fund	3,002.80	.....	3,002.80	.....
Endocrinology Laboratory Fund	1,634.71	11,686.43	9,757.02	3,564.12
Engineering College Gift Fund	.....	365.78	.....	365.78
Engineering College Research Fund	4,435.29	936.00	403.47	4,967.82
English Program for Foreign Students Fund	.....	1,065.00	493.77	571.23
Esso Education Foundation:				
Grant to Chemistry Department	2,915.00	5,165.00	2,707.92	5,372.08
Grant for Science and Engineering	4,370.58	.....	3,136.46	1,234.12

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Fine Arts Purchases Fund	.....	800.00	.....	800.00
Ford Commonwealth Studies International Relations Fund	132,784.98	85,000.00	90,737.34	127,047.64
Ford Foundation:				
Behavioral Sciences Fund	338.70	.....	338.70	.....
Cooperative Program in Humanities Fund	.....	280,000.00	6,201.42	273,798.58
Faculty Research Fellowship for Dr. Lloyd Saville	2,392.00	.....	2,392.00	.....
Fellowship for Dr. James M. Folsam	6,738.00	.....	5,229.49	1,508.51
Grant for Graduate Research Seminars in Economics	190.73	.....	190.73	.....
Grant for Regional Faculty Seminar in Macro-Economics	.....	20,000.00	13,009.71	6,990.29
Grant for Research in Public Affairs	22,494.95	.....	6,042.61	16,452.34
Grant to Dr. J. J. Spengler	676.67	.....	174.01	502.66
Honors-Masters Program	28,865.66	45,000.00	29,087.04	44,778.62
Medical School Income Fund	35,005.68	.....	.....	35,005.68
Socio-Economic Studies of Aging Fund	23,306.62	.....	10,919.84	12,386.78
Sovereignty Under the Law Fund	6,160.09	.....	6,160.09	.....
Teacher Education Grant	37,902.02	.....	21,676.83	16,225.19
Forest Operations for Duke Power Company Fund	13,573.61	202.96	.....	13,776.57
Forest Soils Drainage Research Fund	248.20	.....	.....	248.20
Forestry Bulletin Fund	9,824.61	1,024.83	.....	10,849.44
Forestry Equipment Fund	6,202.00	.....	5,424.97	777.03
Forestry School Fund	285.26	160.87	160.00	286.13
Foundations Fund for Research in Psychiatry Grant B58-04	117.25	.....	117.25	.....
Herman Frasch Foundation Grant #2 to Dr. A. W. Naylor	1,208.26	10,000.00	10,391.52	816.74
Friends of Duke University Library Fund	5,095.44	463.21	573.91	4,984.74
Fund for the Advancement of Education-Political Science Teaching	330.48	.....	100.34	230.14
General Alumni Fund	12,257.43	2,966.86	1,984.78	13,239.51
General Electric Company Grant to Dr. J. W. Brehm	.....	600.00	.....	600.00
General Electric Foundation:				
Grant for Research in Behavioral Science	650.04	.....	.....	650.04
Grant to Dr. Martin Black	69.80	.....	69.80	.....
Grant in Physics	7,533.65	5,000.00	.....	12,533.65
Georgiade Plastics Research Fund	23,686.95	7,824.35	16,633.58	14,877.72
Gifts for Research in Obstetrics and Gynecology Fund	10,629.84	.....	.....	10,629.84
Graduate School Dean's Discretionary Fund	150.00	.....	9,095.00	8,945.00*
Graduate Student Thesis Binding Fund	1,045.00	4,378.00	2,300.50	3,122.50
Graduate School Thesis Fund	8,939.10	1,000.00	1,188.06	8,751.04
James A. Gray Fund	30,134.43	14,032.63	7,656.43	36,510.63
Gynecology and Obstetrics Special Fund	25,196.11	42,465.08	48,335.99	19,325.20
John M. Hammer Fund	135.93	6.89	95.32	47.50
Anna H. Hanes Research Fund	1,157,015.96	643,316.47	195,441.77	1,604,890.66
F. M. Hanes:				
Bequest to the Department of Medicine Fund	9,264.70	67,510.40	41,208.74	35,566.36

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Bequest to the School of Medicine Fund	39,431.83	67,510.40	52,347.53	54,594.70
Memorial Trust Fund	14,809.08	4,608.03	7,050.94	12,366.17
P. Huber Hanes Publication Fund	2,506.83	1,276.20	.....	3,783.03
J. Welch Harriss Library Book Fund	58.25	.....	.....	58.25
John A. Hartford Foundation Grant to Dr. Ralph Thiers	.....	35,000.00	32,027.06	2,972.94
Harvard University Grant to Professor Edward C. Ettin	.....	827.21	827.21	.....
Hematology Research Fund	3,865.62	8,349.50	4,131.45	8,083.67
Frank S. Hickman Prize in Preaching Fund	70.00	.....	70.00	.....
Hoffmann-LaRoche, Inc.:				
Grant to Dr. W. G. Anlyan	12.69	.02	12.71	.....
Grant to Dr. Charles Llewellyn	.....	500.00	369.41	130.59
Grant #R05-3608 to Dr. Blaine Nashold	.....	2,900.00	192.83	2,707.17
Medical Symposium Grant to Dr. Charles Llewellyn	.....	8,250.00	8,846.29	596.29*
Calvin B. Hoover Research Fund	4,687.67	8.65	4,494.01	202.31
Horneman Research Fund	13,049.06	.....	.....	13,049.06
Hospital Administration Fund	67,867.89	38,798.10	27,483.34	79,182.65
Hospital Air Conditioning Service Fund	2,308.53	.....	.....	2,308.53
Hospital Blood Bank Fund	50,299.35	141,506.24	110,181.39	81,624.20
Hospital Chaplain's Fund	.....	8,000.00	7,778.64	221.36
Hospital Dietetics Interns Fund	326.08	173.13	75.90	423.31
Hospital Laundry Equipment Reserve Fund	24,697.00*	16,000.00	6,743.50	15,440.50*
Hospital Library Lost Book Fund	174.09	1,746.54	1,693.54	227.09
Hospital Television Service Fund	37,638.96	17,286.44	6,924.73	48,000.67
Industrial Research Fund	27,057.40	10,000.00	13,275.45	23,781.95
Industrial Waste Conference Fund	991.32	2,707.50	1,419.65	2,279.17
Walker P. Inman:				
Grant to Dr. J. Caulie Gunnells	.....	2,000.00	1,124.32	875.68
Grant to Dr. Kenneth D. Hall	220.50	.....	220.50	.....
Grant to Dr. W. C. Sealy	259.16	.....	259.16	.....
Grant to Dr. Madison Spach	.....	3,076.45	3,027.81	48.64
Grant to Dr. C. R. Stephen	3,500.00	.....	3,500.00	.....
Memorial Grant	1,206.37	8,432.78	.....	9,639.15
Institute for International Order:				
Grant to Dr. Arthur Larson	2,299.68	11.00	238.75	2,071.93
United Nations Publication Fund	3,682.06	2,990.46	6,672.52	.....
International Greek New Testament Project Fund	1,300.00	3,000.00	2,649.99	1,650.01
Japan Society, Inc. Grant	175.68	.....	175.68	.....
Johnson Foundation, Inc. Publication Fund	2,465.00	52.39	2,517.39	.....
Kellogg Foundation Hospital Administration Fund	19,295.45	13,955.00	27,991.56	5,258.89
Johnny Klein Heart Research Fund	3,313.79	2,500.36	476.20	5,337.95
Seymour Korkes Memorial Lecture Fund	172.50	84.20	214.60	42.10
J. Walter Lambeth Library Collection Fund	18,238.19	.....	1,164.76	17,073.43
Law Day Fund	.....	2,414.38	2,056.47	357.91
Law Library Lost Book Fund	37.75	68.06	10.41	95.40

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Law School Dean's Fund	4,073.73	914.79	715.00	4,273.52
Law School Research Fund	1,497.20	1,887.08	439.01	2,945.27
Lawyers Title Foundation Prize Fund	.....	100.00	100.00	.....
Sydney Irwin LeBauer Memorial Fund	25.00	.....	.....	25.00
Lederle Laboratories:				
Medical Faculty Award to Dr. Jack L. Kostyo	11,503.54	.....	9,942.92	1,560.62
Medical Student Fellowship Research Fund	800.00	1,200.00	1,200.00	800.00
"What Goes On" Fund	595.16*	26,000.00	20,661.22	4,743.62
Robert E. Lee Prize Fund	50.00	50.00	50.00	50.00
Library Fee Fund	14,015.27	98,043.00	98,087.62	13,970.65
Library Fee Reserve Fund	1,996.87	.....	50.61	1,946.26
Life Insurance Medical Research Fund:				
Cardiovascular and Respiratory Research Fund	855.76	.....	855.76	.....
Grant G-62-7	2,203.87	.....	2,203.87	.....
Grant G-62-8	2,938.69*	13,200.00	10,261.31	.....
Grant G-62-9	874.79	12,375.00	14,349.81	1,100.02*
Grant G-63-5	.....	3,966.50	3,643.67	322.83
Grant G-63-6	.....	10,671.19	10,612.95	58.24
Eli Lilly Fund for Dr. Eric Marler	.....	5,300.00	1,129.16	4,170.84
Lilly Endowment Grant for Research in Government	47,984.12	26,210.14	15,733.14	58,461.12
Lloyd Brothers Fund	.....	3,000.00	.....	3,000.00
Loblolly Pine Monograph Fund	312.84	.....	.....	312.84
Lost Book Fund	5,794.05	3,873.12	3,188.33	6,478.84
Lutheran Student Gift Fund	54.83	.....	.....	54.83
Mallinckrodt Grant to Dr. Henry D. McIntosh	.....	2,000.00	1,709.31	290.69
Marine Laboratory Dining Hall Reserve Account	.....	3,924.57	8.92	3,915.65
Marine Laboratory Dormitory Reserve Account	.....	1,610.68	.....	1,610.68
John and Mary R. Markle Foundation:				
Fellowship to Dr. Charles E. Mengel	.....	12,000.00	6,959.26	5,040.74
Fellowship to Dr. Suydam Osterhout	504.67*	6,000.00	4,701.39	793.94
Fellowship to Dr. Delford L. Stickel	2,701.14	12,000.00	6,774.49	7,926.65
Fungus Research Fund	1,733.72	.....	205.00	1,528.72
Masters Program in Hospital Administration Fund	.....	.....	89.74	89.74*
Mathematics Department Equipment Fund	2,740.00	.....	2,740.00	.....
Mathematics Mural Fund	600.00	.....	.....	600.00
George W. Matheson Memorial Fund	9.17	30.46	39.63	.....
Olin Mathieson Chemical Corporation Award to College of Engineering	.....	1,000.00	.....	1,000.00
William McDougall Research Fund	21,665.58	46,250.56	65,507.47	2,408.67
Martha Cozart McLeod Memorial Fund	625.50	.....	.....	625.50
Mead Johnson and Company:				
Grant to Dr. Walter Obrist	.....	2,500.00	478.44	2,021.56
Medical Fund	3,113.11	.....	3,112.97	.14
Pediatric Program Fund	2,918.21	500.00	564.00	2,854.21
Medical Record Library Fund	1,109.06	3,562.72	57.56	4,614.22
Medical Research Fund	60,584.18	29,481.26	37,366.06	52,699.38

*Indicates Deficit·

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Medical School Discretionary Fund	130.00	.....	18.78	111.22
Medical School Library Committee Fund	222.44	35.00	236.31	21.13
Medical School Miscellaneous Fund	85.24	18.76	104.00	.....
Merrill-Renzulli Foundation Pediatric Fund	5,000.00	.....	.....	5,000.00
Methodist Board of Education Book Fund	2,448.59	.....	757.75	1,690.84
Methodist Christian Higher Education Fund	125,552.79	20,214.95	.....	145,767.74
Methodist Church Divinity School Pension Fund	861.09	.....	.....	861.09
Miscellaneous Awards and Prizes Fund	43.00	550.00	37.00	556.00
Monsanto Chemical Corporation Fellowship in the Department of Chemistry Fund	301.87	2,000.00	2,034.80	267.07
Music Department Discretionary Fund	.....	500.00	.....	500.00
Music Department Record Collection Fund	103.49	61.06	.....	164.55
National Academy of Sciences Contract No. PH43-63-65 Sub. #12	.....	.....	3,212.85	3,212.85*
National Cystic Fibrosis Foundation:				
Fellowship #270-4 to Henry Stanfield	.....	950.00	906.00	44.00
Grant to Dr. Alexander Spock-1964	3,682.97*	20,214.45	16,531.48	.....
Grant to Dr. Alexander Spock-1965	.....	2,300.00	8,905.66	6,605.66*
National Fund for Medical Education:				
Grant #1	2,261.56	.....	475.79	1,785.77
Grant #2	153.43	.....	124.29	29.14
Grant #3	3.35	.....	.....	3.35
Grant #4	539.10	.....	22.34	516.76
Grant #5	14.20	.....	14.20	.....
Grants Program	.....	12,500.00	.....	12,500.00
Special Purpose Grant	1,313.92	.....	514.84	799.08
National Neurological Foundation Fellowship	225.47*	39,000.00	12,131.72	26,642.81
National Plant Food Institute Grant to Dr. F. W. Woods	14.68	.....	.....	14.68
National Science Foundation:				
Grant G-23126	3,295.24	7,155.33	5,206.29	5,244.28
Grant G-23533	2,285.94	2,887.26	5,173.20	.....
Grant GE-1379	3,682.90	4,761.35	7,825.60	618.65
Grant GE-2117	6,766.17	4,920.68	5,187.53	6,499.32
Grant GE-5100	.....	8,610.00	.....	8,610.00
Grant GE-5157	.....	12,750.00	.....	12,750.00
Grant GE-5352	.....	7,490.00	.....	7,490.00
Grant GE-5431	.....	22,640.00	.....	22,640.00
Graduate Fellowship Program Grant	12,800.16	5,400.00	12,307.16	5,893.00
Institutional Grant G-18238	15,079.23	186,327.00	20,241.48	181,164.75
National Shade Tree Conference Fellowship	376.59	6,000.00	5,186.84	1,189.75
National Tuberculosis Association:				
Grant #R & S 7a-6	2,190.67	.....	2,190.67	.....
Grant #R & S 7a-31	1,082.08	.....	1,082.08	.....
Grant #R & S 7a-35	.....	7,981.00	3,856.17	4,124.83
Neurosurgical Research Fund	2,097.29	.....	467.66	1,629.63
Newman, Georgia Heart Research Fund	266.30	.....	161.96	104.34
Newspaper Education Workshop Fund	56.84	.....	56.84	.....

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
N. C. Board of Health Community Health Training Program Grant	2,642.76	4,500.00	5,150.00	1,992.76
North Carolina Board of Science and Technology: Grant #3	.....	.....	250.00	250.00*
North Carolina Conference Higher Education Fund	518.45	906.80	.....	1,425.25
North Carolina Heart Association:				
Grant to Dr. William F. Barry Jr.	74.39*	74.39	.....	.....
Grant to Dr. John Boineau	.....	1,986.00	1,005.59	980.41
Grant to Dr. I. W. Brown, Jr.	172.67	.....	172.67	.....
Grant to Dr. I. W. Brown, Jr.	2,000.00	.....	1,283.98	716.02
Grant to Dr. R. Canent, Jr.	788.00	2.00	790.00	.....
Grant to Dr. James R. Clapp	.....	1,950.00	811.39	1,138.61
Grant to Dr. E. H. Estes	12.30	2.01	14.31	.....
Grant to Dr. Walter L. Floyd	1,783.82	.....	1,783.82	.....
Grant to Dr. Walter L. Floyd	1,000.00	.....	1,000.00	.....
Grant to Dr. Samuel J. Friedberg	.....	2,000.00	646.20	1,353.80
Grant to Dr. F. J. Gorten	.....	1,960.00	45.91	1,914.09
Grant to Dr. Joseph C. Greenfield	1,183.23	1,900.00	2,002.01	1,081.22
Grant to Dr. J. Caulie Gunnells	1,595.70	.....	1,524.79	70.91
Grant to Dr. Donald B. Hackel	.....	2,000.00	1,250.00	750.00
Grant to Dr. Kenneth D. Hall	1,188.45	1,128.09	2,316.54	.....
Grant to Dr. Leonard Hart	44.26*	78.24	33.98	.....
Grant to Dr. Albert Heyman	81.42	2,028.93	186.13	1,924.22
Grant to Dr. Albert Heyman	903.90	.....	729.62	174.28
Grant to Dr. G. H. Ira, Jr.	30.00	.....	30.00	.....
Grant to Dr. Henry Kamin	229.70	.....	20.80	208.90
Grant to Dr. Kaye Kilburn	.....	2,001.00	1,237.31	763.69
Grant to Dr. Norman Kirshner	821.34	.....	.....	821.34
Grant to Dr. Yi-Hong Kong	.....	1,890.00	.....	1,890.00
Grant to Dr. F. Maxton Mauney	2,000.00	.....	1,162.62	837.38
Grant to Dr. Benjamin W. McCall	649.83	.....	649.83	.....
Grant to Dr. James Morris	.....	1,125.00	.....	1,125.00
Grant to Dr. Hiroshi Nagaya	1,900.00	.....	1,022.58	877.42
Grant to Dr. Ernst Peschel	1,916.60	.....	375.10	1,541.50
Grant to Dr. Roscoe R. Robinson	32.72	12,000.00	11,588.98	443.74
Grant to Dr. H. A. Saltzman	326.47*	1,850.00	1,523.53	.....
Grant to Dr. H. A. Saltzman	2,000.00	2,100.00	3,536.13	563.87
Grant to Dr. H. O. Sieker	1,504.66	.....	1,504.66	.....
Grant to Dr. Wirt W. Smith	2,000.00	.....	1,035.51	964.49
Grant to Dr. Madison Spach	46.33	2.68	49.01	.....
Grant to Dr. Howard K. Thompson	1,956.00	1,650.00	2,645.75	960.25
Grant to Dr. George Tindall	.....	2,000.00	57.50	1,942.50
Grant to Dr. R. E. Whalen	2,000.00	1,915.00	2,036.71	1,878.29
Grant to Dr. Benjamin Wittels	36.49	.....	36.00	.49
North Carolina Land Ownership Study Fund	279.95	.....	33.40	246.55
Nurse Anesthesia Fund	372.99	100.00	149.67	323.32
Nursing School Annual Lecture Series Fund	.....	1,495.07	480.28	1,014.79
Nursing Service Educational Fund	.....	7,500.00	.....	7,500.00
Obstetrics and Gynecology Bacteriologic Research Fund	15,752.82	600.00	.....	16,352.82
Obstetrics and Gynecology Departmental Fund	81,698.33	19,485.74	.....	101,184.07
Obstetrics and Gynecology E. C. Hamblen Endocrine Fellowship Fund	1,885.13	3,600.00	2,772.65	2,712.48

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Obstetrics and Gynecology Special Endocrine Fund	11,572.97	17,400.00	23,545.10	5,427.87
Office of Institutional Advancement Fund	12,164.41	.....	12,164.41	.....
Office of Ordnance Research Building Reserve Fund	33,094.39	10,581.33	.....	43,675.72
Operating Room Fund	2,428.49	75,000.00	67,141.90	10,286.59
Operating Room Study Fund	.....	2,500.00	167.25	2,332.75
Ophthalmology Department Fund	13,561.45	25,726.50	28,777.82	10,510.13
Ophthalmology Research Fund	18.10	.....	18.10	.....
Orthopaedic Research & Education Foundation Fund	.....	2,250.00	2,972.57	722.57*
Otolaryngology Fund	417.62	.....	49.49	368.13
Parke, Davis and Co. Research Grant for Dr. Philip Handler	2,054.04	.....	79.46	1,974.58
Roy T. Parker Research Fund	8,794.14	10,384.60	100.00	19,078.74
Pathology Department Fund	1,722.61	3,541.25	5,187.93	75.93
Peace Research Institute Papers Fund	399.83	.....	232.29	167.54
A. S. Pearse Research Fund	.....	1,346.63	1,265.00	81.63
Pediatric Department Fund	99,083.60	102,436.49	44,467.14	157,052.95
Pediatric Endocrinological Research Fund	409.17	.....	326.65	82.52
Pediatric House Staff Medical Library Fund	1,500.00	.....	6.15	1,493.85
T. L. Perkins Fund	29,315.98	910.04	.....	30,226.02
Pfizer Laboratory Fund	.....	4,500.00	570.90	3,929.10
Philip Morris Research Assistant in Chemistry	875.00	5,000.00	3,284.86	2,590.14
Phillips Foundation Grant for Administrative Intern	.....	9,000.00	9,000.00	.....
Physical Plant Betterment Fund	673,097.23	.....	387,686.33	285,410.90
Physical Therapy Fund	690.50	45.26	161.15	574.61
Physics Department Supplementary AEC Contract	221,942.07	.....	20,447.16	201,494.91
Plastic and Oral Surgery Fund	4,798.26	.....	.....	4,798.26
Plastic Surgery Residents' Fund	324.64	.....	.....	324.64
Plough, Inc. Grant for Pediatric Study	4,713.28	.....	.....	4,713.28
Population Studies Program	.....	3,747.87	3,734.24	13.63
Pre-Fab Apartments Reserve Fund	20,637.40	.....	.....	20,637.40
R. C. Price International Peace Studies Fund	25,696.51	38,818.87	22,172.82	42,342.56
Propaganda Project Fund	2,513.88	47.78	2,561.66	.....
Provost Fund	50,904.18	.....	16,130.03	34,774.15
Provost Grant to Dr. Charles E. Ferguson	.....	10.00	.....	10.00
Psychiatric Research Fund	314,197.94	229,262.27	118,692.71	424,767.50
Psychobiological Research Fund	24,116.95	544.15	2,312.35	22,348.75
Psychology Clinical Training Fund	300.00	.....	.....	300.00
Psychology Department Equipment Fund	22,860.00	.....	16,044.55	6,815.45
Psychology Research Fellowship Fund	13,987.11	17,261.11	6,493.93	24,754.29
Purdue Frederick Co. Drug Research Fund	1,747.01	.....	1,747.01	.....
Radiological Society Fund	990.60	1,031.85	1,424.25	598.20
Radiology Search Committee Grant to Dr. H. D. McIntosh	.....	2,000.00	1,127.14	872.86
James H. Rand Research Fund	5,000.00	.....	.....	5,000.00
Russell Ranson's Engineering Fund	5,100.00	.....	500.00	4,600.00

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Regional Assembly for Cultural Affairs & Foreign Relations Fund	.....	6,089.93	6,089.93	.....
Rehabilitation Account Fund	1,024.05	702.92	366.37	1,360.60
Research Corporation Grant to Dr. Jacques Poirier	.....	1,800.00	433.33	1,366.67
Research Publication Fund	12,811.13	6,327.55	13,500.00	5,638.68
Resources for the Future, Inc.: Forestry Fund	1,733.26	.....	65.74	1,667.52
Grant to Dr. Hollman H. Winsborough	6,884.74	.....	6,437.74	447.00
Grant to Dr. J. G. Yoho	.....	10,000.00	1,416.67	8,583.33
Research Equipment Fund for Dr. R. J. Menzies	6,489.00	.....	.....	6,489.00
Retail Stores Betterment Fund	67,959.71	51,542.23	71.31	119,430.63
Anita Ritter Memorial Fund	23,916.90	700.00	.....	24,616.90
A. H. Robins Co., Inc. Research Grant to Dr. C. R. Stephen	4,881.71	8,000.00	9,736.09	3,145.62
Rockefeller Foundation:				
Grant GA-HSS-6386	.....	15,000.00	13,130.23	1,869.77
Grant GA-HUM-60100	1,554.97	.....	1,554.97	.....
Grant GA-SS-6013	8,000.00	.....	.....	8,000.00
Grant RF-61026	3,697.91	19,154.57	13,500.50	9,351.98
Grant RF-61153-#16	2,939.58	.....	2,939.58	.....
Grant RF-61171-#14	586.22	.....	586.22	.....
Grant RF-62133-Allocation #68	.....	8,900.00	6,613.30	2,286.70
Grant for Master of Science Program	8,543.79	19,979.53	25,489.76	3,033.56
Rural Church Clinic	.....	15.00	.....	15.00
Schering Corporation Grant to Dr. W. P. Wilson	.....	2,600.00	1,097.04	1,502.96
Sealantic Fund	656.97*	7,500.00	6,346.33	496.70
G. D. Searle and Company:				
Research of Dr. G. J. Baylin Fund	16.41*	16.41	.....	.....
Synthetic Drugs Research Fund	3,972.30	.....	3,972.30	.....
Robert E. Seibels, Jr. Memorial Laboratory Fund	4,446.64	1,431.51	.....	5,878.15
Shell Companies Foundation, Inc.:				
Fellowship in Biochemistry Fund	.....	3,500.00	3,480.38	19.62
Fellowship in Engineering Fund	194.64*	3,500.00	3,000.00	305.36
Fundamental Research Grant in Physics	5,647.85	5,000.00	2,027.76	8,620.09
Research Grant in Chemistry	.....	5,000.00	440.92	4,559.08
W. W. Shingleton Research Fund	1,477.76	7,200.00	5,746.80	2,930.96
Alfred P. Sloan Foundation:				
Grant BR-479	14,619.90	.....	4,708.89	9,911.01
Grant BR-480	272.97	700.00	175.77	797.20
Grant to Dr. J. C. Poirier	8,193.93	.....	1,691.15	6,502.78
Smith, Kline and French:				
Grant to Dr. Frederick Bernheim	.....	1,000.00	250.00	750.00
Grant to Dr. J. L. Callaway	244.47	1,750.00	190.74	1,803.73
Grant to Dr. C. R. Hauser	.....	1,000.00	1,000.00	.....
J. Graham Smith Research Fund	3,426.78	3,250.00	6,461.10	215.68
Lilly Webb Smith Fund for Underprivileged Children	358.85	.....	.....	358.85
Socio-Economic Studies of Aging Symposium Fund	1,000.00	.....	1,000.00	.....
Sororities Facilities Fund	409.00	284.00	.....	693.00

*Indicates Deficit.

Schedule E (Continued)—Current Restricted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Southeastern Jurisdictional Fund for Ministerial Education	84,332.67	77,116.64	1,000.00	160,449.31
Southern Forest Disease & Insect Research Council Fund	2,245.85	2,074.00	2,541.20	1,778.65
Southern Pulpwood Conservation Association Research Fund	3,669.15	4,800.00	2,752.08	5,717.07
Soviet-American Citizens Conference Fund	.....	7,500.00	.....	7,500.00
Special Engineering Faculty Award Fund	.....	8,800.00	1,803.00	6,997.00
Special Gifts for Library Books Fund	20,838.30	21,705.38	21,224.34	21,319.34
E. R. Squihb and Sons Grant to Dr. E. E. Owen and Dr. M. P. Tyor	1,036.67	.....	328.93	707.74
Squihb Institute Grant to Dr. M. P. Capp	.....	300.00	.....	300.00
Strasburger Research Fund	9.33*	9.33	.....	.....
Student Project Fund	682.22	.....	.....	682.22
Summer Institute for English Teachers Fund	771.57*	771.63	.06	.....
Surgical Clinical Research Laboratory Fund	7,658.32	1,685.68	5,367.52	3,976.48
Surgical Research Fund	80,952.55	1,791.67	.....	82,744.22
Surgical Search Committee Fund	.....	1,500.00	277.17	1,222.83
Surgical Shop Fund	37,645.65	1,184.00	13,979.67	24,849.98
Surtsey Planning Conference Fund	.....	1,870.53	1,870.53	.....
Taylor Foundation Orthopedic Fund	5,036.00	72.00	.....	5,108.00
James A. Thomas Memorial Fund	3,063.53*	.....	.....	3,063.53*
Thoracic Research Fund	10,282.13	.....	20.00	10,262.13
Thoracic Surgery Fund	3,860.66	2,423.50	3,835.15	2,449.01
Wright Tisdale Fund	.....	7,000.00	.....	7,000.00
Tobacco Chemistry Research Program Fund	4,544.37	.....	3,413.62	1,130.75
Tobacco Industry Research Committee Fellowship Fund	399.98	600.02	600.00	400.00
Tobacco Research Fund	574.79	.....	311.56	263.23
Trent Lecture Fund	.....	250.00	250.00	.....
Undergraduate Science Education Equipment Fund	8,351.70	.....	8,348.68	3.02
Union Carbide and Carbon Corporation Fellowship in Organic Chemistry Fund	1,011.56	4,000.00	3,809.49	1,202.07
United Health & Medical Research Foundation of South Carolina	192.56*	249.61	10.00	47.05
United Medical Research Foundation of North Carolina Fund	28,743.30	29,005.49	27,540.65	30,208.14
United States Steel Foundation, Inc. Fund	40,000.00	20,000.00	.....	60,000.00
United States Steel Foundation, Inc. Graduate Fellowship in Physics	2,597.58	.....	3,199.98	602.40*
Upjohn Company Research Fund	7,270.39	8,075.00	3,651.81	11,693.58
Urological Research Fund	12,095.77	5,476.52	4,563.06	13,009.23
Vitamix, Inc. Grant to Dr. H. D. McIntosh	846.01	1,594.00	294.84	2,145.17
Weltman Lahoratory Account	5,496.19	4,270.67	3,626.39	6,140.47
West Virginia Experimental Forest Library Research Fund	70.57	.....	.....	70.57

*Indicates Deficit.

Schedule E (Continued)—Current Restrieted Funds

Name of Fund	*Balance July 1, 1963*	*Received*	*Disbursed*	*Balance June 30, 1964*
Western Electric Employees Summer Course Fund	1,972.35	.....	.....	1,972.35
Winthrop Laboratories Grant to Dr. C. R. Stephen	.....	3,020.00	431.52	2,588.48
Wisconsin University Grant to Dr. Juanita Kreps	.....	1,828.00	1,282.80	545.20
Woodrow Wilson Fellowship Fund	7,667.20	24,000.00	5,300.00	26,367.20
Woodrow Wilson Graduate School Fund	10,675.69	8,000.00	960.00	17,715.69
Woman's College Student Aid Fund	1,220.00	15.00	135.00	1,100.00
Woman's College Student Center Fund	.....	908.00	.....	908.00
Woman's College Student Project Fund	25.00	.....	.....	25.00
World Rule of Law Discretionary Fund	40.00	.....	.....	40.00
Wyeth Laboratories Allergy Fund	4,330.91	.....	3,976.24	354.67
X-Ray Department Fund	24,998.09	26,994.75	19,562.82	32,430.02
York Chapel Fund	2,927.64	.....	41.00	2,886.64
Glenn Young Research Fund	3,028.42	.....	162.34	2,866.08
Total Non-Governmental	$6,876,257.27	$ 8,356,667.48	$ 4,380,591.76	$10,852,332.99
Grand Total	$8,044,628.62	$20,473,679.83	$16,607,604.71	$11,900,703.74

SCHEDULE F—GIFTS, GRANTS AND CONTRACTS FOR RESEARCH

INDIVIDUALS:		
Anonymous		$ 600.00
R. A. Brannen		1,000.00
F. M. Hanes Bequest to Department of Medicine		67,510.40
F. M. Hanes Bequest to School of Medicine		67,510.40
F. M. Hanes Memorial Trust Fund		4,608.03
Fred W. Klein		1,750.00
Paula Von Klein		500.00
Ralph C. Price		36,000.00
William H. Ruffin		5,000.00
United Nations		3,747.87
Warren R. Williams		5,000.00
Sterling Winthrop		2,600.00
University of Wisconsin		1,828.00
James B. Wyngaarden		500.00
47 Other Contributors		3,863.86
		202,018.56
INDUSTRY:		
Abbott Laboratories	$ 8,250.00	
American Tobacco Company	22,000.00	
Anonymous	10,000.00	
Ayerst Laboratories	9,100.00	
Babcock and Wilcox Company	800.00	
Baxter Laboratories	2,400.00	
Bristol Laboratories	4,100.00	
Burlington Industries	1,900.00	
Carnegie Corporation of New York	60,000.00	
Ciba Pharmaceutical Products	7,000.00	
E. I. DuPont de Nemours & Company	5,000.00	
Ethicon, Inc.	1,200.00	
Fraser Sweatman, Inc.	3,000.00	
General Electric Company	5,600.00	
Greenwood Mills	500.00	
Hoffmann -LaRoche, Inc.	4,900.00	
Johnson and Johnson	1,723.50	
Eli Lilly & Co.	16,300.00	
Lilly Endowment, Inc.	25,000.00	
Mallinckrodt Chemical	2,000.00	
Mead Johnson & Company	11,500.00	
Merck & Co., Inc.	3,000.00	
Norwich Pharmaceutical	2,000.00	
Olin Mathieson Chemical	1,300.00	
Philip Morris, Inc.	5,000.00	
Procter & Gamble Company	3,000.00	
Charles Pfizer & Company	4,500.00	
Research Corporation	1,800.00	
A. H. Robins Company	8,000.00	
William H. Rorer, Inc.	5,000.00	
Schering Corporation	2,600.00	
G. D. Searle & Company	7,200.00	
Smith, Kline & French Laboratories	2,000.00	
Southern Pulpwood	6,874.00	
Upjohn Company	9,550.00	
Vitamix, Inc.	1,500.00	
Westwood Pharmaceuticals	1,000.00	
9 Other Contributors	2,144.08	268,741.58

Schedule F (Continued)—Gifts, Grants and Contracts for Research

FOUNDATIONS:		
American Academy of Pediatrics	4,000.00	
American Cancer Society	178,862.72	
American Heart Association	9,555.20	
American Society of International Law	5,107.12	
Mary Reynolds Babcock Foundation	25,000.00	
Mary Duke Biddle Foundation	24,565.00	
Council of Tobacco Research	15,000.00	
The Duke Endowment	25,000.00	
Duke Laboratory Foundation	500.00	
Durham Cerebral Palsy Foundation	500.00	
Esso Education Foundation	5,000.00	
The Ford Foundation	213,849.91	
Herman Frasch Foundation	10,000.00	
John Hartford Foundation	35,000.00	
Walter Kempner Foundation, Inc.	18,000.00	
Life Insurance Medical Research Fund	40,205.00	
John and Mary R. Markle Foundation	12,000.00	
National Academy of Science	169.46	
National Cystic Fibrosis Foundation	20,300.00	
National Fund for Medical Education	12,500.00	
National Tuberculosis Association	7,325.05	
North Carolina Heart Association	38,377.00	
Orthopaedic Research	2,250.00	
Stanley F. Raczynski Foundation	10,000.00	
Resources for the Future, Inc.	10,000.00	
Rockefeller Foundation	19,154.57	
Shell Companies Foundation	10,000.00	
Tobacco Industry Research Committee	11,280.00	
United Medical Research Foundation	28,600.00	792,101.03
GOVERNMENT:		
Atomic Energy Commission	343,429.38	
National Aeronautics and Space Administration	33,373.49	
National Science Foundation	713,496.62	
North Carolina Board of Health	33,873.74	
Small Business Administration	1,338.95	
United States Air Force	160,361.53	
United States Army	1,691,688.24	
United States Department of Agriculture	17,005.00	
United States Fish and Wildlife Service	20,522.93	
United States Navy	143,737.46	
United States Office of Vocational Rehabilitation	19,470.36	
United States Public Health Service	5,278,165.93	
United States Vocational Rehabilitation Administration	54,000.00	8,510,463.63
		$9,773,324.80

SCHEDULE G—GRANTS AND CONTRACTS FOR TRAINING PROGRAMS

American Cyanamid Company		$ 3,500.00
Approved Supply Pastors School:		
Methodist Board of Education	$ 5,250.00	
North Carolina Conference	2,500.00	
Southeastern Jurisdictional Conference	7,102.40	
South Carolina Conference	937.50	
Virginia Conference	2,062.50	
Western North Carolina Conference	3,945.00	
2 other contributors	250.00	22,047.40
Bell Telephone Laboratories		14,380.00
James A. Gray Trust		14,032.63
National Science Foundation		287,377.06
North Carolina Board of Health		17,845.92
North Carolina Conference		506.80
Rockefeller Foundation		19,979.53
United States Air Force		1,109.00
United States Navy		8,400.06
United States Public Health Service		1,885,044.86
United States Vocational Rehabilitation Administration		26,525.17
1 other contributor		400.00
		$2,301,148.43

SCHEDULE H—GIFTS FOR THE LIBRARIES

American Association of Theological Schools	$ 3,000.00
Associates of the Trent Collection	1,588.50
Mary Duke Biddle Foundation	10,900.00
Board of Education of Methodist Church	3,000.00
3 other contributors	598.21
	$ 19,086.71

SCHEDULE I—GIFTS FOR CURRENT EXPENSES

American Cancer Society		$ 500.00
American Medical Education Foundation		4,397.91
Mr. and Mrs. D. S. Campbell		500.00
The Duke Endowment		45,000.00
Dr. Deryl Hart		9,500.00
Gifts from Industry:		
The Alcoa Foundation	$ 625.00	
Allis-Chalmers Foundation, Inc.	1,200.00	
American Can Company Foundation	500.00	
American Oil Foundation	15,000.00	
Avon Products	500.00	
Babcock & Wilcox Company	800.00	
Burlington Industries	1,000.00	
Chase Manhatten Bank	10,000.00	
Continental Oil Company	1,000.00	
Esso Education Foundation	7,500.00	
Equitable Life Assurance Society	1,000.00	
First National City Bank	1,536.00	

Schedule I (Continued)—Gifts for Current Expenses

Ford Motor Company Fund	1,000.00	
General Motors Corporation	7,125.00	
Gulf Oil Company	2,083.00	
Household Finance Foundation	600.00	
Johnson Wax Fund	1,000.00	
Mellon Bank and Trust Company	1,000.00	
Merck and Co., Inc.	500.00	
Morgan Guaranty Trust Co.	1,200.00	
National Dairy Products	5,000.00	
National Merit Scholarship Corporation	14,850.00	
North Carolina Foundation of Church-Related Colleges, Inc.	518.64	
Philip Morris, Inc.	1,050.00	
Procter & Gamble Fund	2,400.00	
R. J. Reynolds Tobacco Co.	5,000.00	
Shell Companies Foundation	6,000.00	
Texaco, Inc.	3,000.00	
Timken Roller Bearing Co., Educational Fund, Inc.	1,050.00	
Travelers Insurance Co.	750.00	
Union Bag-Camp Paper Corp.	600.00	
Western Electric Foundation	600.00	
5 other contributors	1,050.00	97,037.64
Richard King Mellon Charitable Trusts		50,000.00
Methodist Committee on World Service		98,500.00
Methodist Conferences		47,565.43
National Defense Fellowship Program		102,011.59
National Fund for Medical Education		26,760.00
National Society of Accountants for Cooperatives		3,341.88
Rockefeller Foundation		1,000.00
Southern Fellowships Fund		1,937.07
		$ 488,051.52

SCHEDULE J—GIFTS FOR FELLOWSHIPS AND SCHOLARSHIPS

American Cyanamid Company		$ 1,200.00
Anonymous		14,981.55
Asia Foundation		3,750.00
Mary R. Babcock Foundation		5,600.00
Brunswick Pulp and Paper Company		1,250.00
Council for Tobacco Research		600.00
Divinity School Miscellaneous Scholarship Fund:		
Fred W. Bradshaw	$ 2,400.00	
First Methodist Church	800.00	
North Carolina Conference	2,500.00	
South Carolina Conference	1,200.00	
Western North Carolina Conference	2,500.00	
1 other contributor	400.00	9,800.00
Angier B. Duke Memorial, Inc.		155,400.00
James B. Duke 100th Anniversary Fund		40,064.17
Duke University Sundry Scholarship Fund:		
Alcoa Foundation	625.00	
Burlington Industries Foundation	1,000.00	
Thomas A. Finch Foundation	850.00	
General Motors Corporation	10,925.00	
Manoocherian-Robbins Foundation	500.00	

Schedule J (Continued)—Gifts for Fellowships and Scholarships

Methodist Church Board of Education	2,250.00	
N. C. Section American Waterworks Association	500.00	
Peat, Marwick, Mitchell & Co.	800.00	
Price Waterhouse Company	800.00	
Procter & Gamble Company	5,548.00	
Texaco, Inc.	6,000.00	
Union Bag-Camp Paper Corporation	1,200.00	
1 other contributor	200.00	31,198.00
E. I. DuPont de Nemours & Company		2,660.00
Ford Foundation		44,809.27
General University Scholarship Fund:		
Duke University Athletic Association	35,500.00	
Thomas A. Finch Foundation	2,000.00	
A. E. Finley Foundation	1,050.00	
Goodman Foundation	1,000.00	
A. F. Hooker	500.00	
B. E. Jordan	500.00	
Pine State Knitwear Co.	2,390.00	
Seven Up-R. C. Bottling Co.	500.00	
J. R. Smith	500.00	
Earle W. Webb	500.00	
117 other contributors	14,044.03	58,484.03
International Shade Tree		6,000.00
Walter Kempner		14,525.00
Koppers Foundation		800.00
The Lilly Company		800.00
Manoocherian-Robbins Foundation, Inc.		500.00
John and Mary R. Markle Foundation		18,000.00
Monsanto Chemical Company		2,000.00
Amy Muse		1,200.00
National Aeronautics and Space Administration		59,000.00
National Cystic Fibrosis Foundation		950.00
National Neurological Foundation		39,000.00
National Science Foundation		53,327.90
The Perry Foundation		2,500.00
Ellis P. Phillips Foundation		9,000.00
Rockefeller Foundation		23,808.30
Shell Companies Foundation		7,000.00
Union Carbide Chemicals Corporation		4,000.00
United States Fish & Wildlife Service		4,780.00
United States Public Health Service		161,257.48
The White Foundation		500.00
Lottie P. Whitehead Foundation		4,500.00
Woodrow Wilson National Fellowship Fund		32,000.00
633 other contributors		18,643.56
		$833,889.26

SCHEDULE K—GIFTS FOR MISCELLANEOUS PURPOSES

Anonymous	$ 8,800.00
American Cyanamid Company	26,000.00
American Heart Association	4,282.00
American Historical Association	4,272.00
Associated Engineering Company	1,000.00

Schedule K (Continued)—Gifts for Miscellaneous Purposes

Mary Duke Biddle Foundation	53,000.00
Board of Education, Methodist Church	5,000.00
Carnegie Corporation of New York	13,000.00
Columbia University	6,089.93
The Duke Endowment	262,542.00
E. I. DuPont de Nemours & Company	5,000.00
Ford Foundation	20,000.00
Golden Cross Fund	2,000.00
John S. Guggenheim Memorial Foundation	7,500.00
Hanes Hosiery Mills	2,000.00
Harvard University	827.21
Hoffmann-LaRoche, Inc.	8,250.00
Institute for International Order	1,500.00
Johnson Foundation, Inc.	7,500.00
W. K. Kellogg Foundation	13,955.00
Walter Kempner	5,300.00
Ralph Kurbaum	535.00
Lloyd Brothers, Inc.	3,000.00
National Federation of Music Clubs	500.00
National Science Foundation	8,013.90
North Carolina Association of Colleges and Secondary Schools	1,250.00
North Carolina Conference	4,000.00
North Carolina Pastors School	900.00
Nurses Student Government Association	1,000.00
Rockefeller Foundation	519.97*
Summer Institute for English Teachers	771.63
Wright Tisdale	7,000.00
United States Air Force	4,600.00
United States Department of Health, Education, and Welfare	7,500.00
Western North Carolina Conference	10,000.00
113 other contributors	6,661.34
	$ 513,030.04

SCHEDULE L—GIFTS FOR PROFESSORSHIPS

Mary Duke Biddle Foundation	$ 29,200.00
The Duke Endowment	100,000.00
	$ 129,200.00

SCHEDULE M—GIFTS FOR PLANT AND EQUIPMENT

Mary B. Allen	$ 4,968.50
Mary Duke Biddle Foundation	73,380.00
The Duke Endowment	3,762,997.00
Duke Hospital Auxiliary	1,857.65
Duke Publication Board	1,050.00
Mrs. Melba D. Greenlee	12,875.00
Richard Kratz	500.00
National Science Foundation	1,724,162.42
North Carolina Medical Care Commission	185,435.47
Sandoz, Inc.	10,000.00
Dr. James H. Semans	600.00
Southeastern Jurisdictional Conference	72,319.18

*Indicates Deficit

Schedule M (Continued)—Gifts for Plant and Equipment

United States Public Health Service	186,118.00
United States Steel Foundation	20,000.00
Western North Carolina Conference	15,467.00
Woman's College Class of 1964	625.00
37 other contributors	1,311.60
	$6,073,666.82

SCHEDULE N—GIFTS AND BEQUESTS TO PERMANENT FUNDS

For Endowment Funds:		
1 contributor		$ 450.00
For Endowed Special Funds:		
B. C. Remedy Company	$ 2,000.00	
Dr. Mark T. Frizzelle	1,000.00	
Full Membership Group, D. U. Church	500.00	
Estate of A. Lee Hardt	1,615.07	
T. C. Heyward	500.00	
Thelma Ingles	500.00	
Mr. and Mrs. E. L. Jones	500.00	
E. L. Jones, Jr.	525.00	
Mr. and Mrs. W. A. Kale	3,000.00	
Poplar Realty Co.	500.00	
Mr. and Mrs. S. Donald Sherrerd	2,000.00	
89 other contributors	3,119.77	15,759.84
For Scholarship Funds:		
Broyhill Educational Fund Inc.	500.00	
Mr. and Mrs. W. Franklin Brown	1,000.00	
Burlington Industries Foundation	2,300.00	
Central Carolina Rehabilitation Hospital, Inc.	34,481.15	
Dr. James T. Cleland	2,000.00	
Bequest of Mac Hooks Hyman	3,034.14	
Mrs. William P. Johnston	500.00	
B. E. Jordan	1,000.00	
Amos R. Kearns	1,000.00	
Amy Muse	507.22	
George E. Norman, Jr.	2,300.00	
Old Dominion Candies Co.	1,000.00	
Robert L. Wolf	500.00	
B. S. Womble	1,220.00	
W. F. Womble	1,115.00	
55 other contributors	3,507.74	55,965.25
For Loan Funds:		
Aloe Charitable Trust	6,000.00	
Albert Anderson Trust	2,046.34	
Dr. and Mrs. George Brumley	1,200.00	
The Merck Company Foundation	3,000.00	
Wylma C. Woolard	500.00	
5 other contributors	1,422.56	14,168.90
		$ 86,343.99

DUKE UNIVERSITY INVESTMENTS

Fiscal year ended June 30, 1964

Bonds Par Value	
	U. S. Treasury
700M	Bills 7/2/64
125M	Bills 7/15/64
475M	3¾% Notes 8/15/64
50M	Bills 11/5/64
1,103M	3⅞% Notes 5/15/65
50M	3⅞% Notes 8/13/65
700M	3⅝% Notes 2/15/66
40M	4% Notes 8/15/66
25M	4% Bonds 10/1/69
1M	2½% Bonds 12/15/69
237M	4% Bonds 2/15/72
999.50M	3% Bonds 2/15/95
	U. S. Government Instrumentalities
1,460M	Federal Home Loan Banks 3.95% Notes 7/15/64
960M	Federal Home Loan Banks 3.90% Notes 8/17/64
1,000M	Federal Home Loan Banks 4% Notes 9/15/64
2,470M	Federal Home Loan Banks 3½% Bonds 10/15/64
590M	Federal Home Loan Banks 3⅞% Notes 11/16/64
630M	Federal Home Loan Banks 4.05% Notes 1/15/65
1,365M	Federal Home Loan Banks 4.15% Notes 2/15/65
2,575M	Federal Home Loan Banks 4.10% Notes 4/15/65
850M	Federal Home Loan Banks 4⅛% Notes 5/17/65
1,690M	Federal Home Loan Banks 3¾% Bonds 9/15/65
3,000M	Federal Home Loan Banks 4⅛% Bonds 8/15/66
125M	Federal Intermediate Credit Banks 4% Deb. 10/1/64
1,000M	Federal Intermediate Credit Banks 3.90% Deb. 11/2/64
500M	Federal Intermediate Credit Banks 4.05% Deb. 1/4/65
975M	Federal Intermediate Credit Banks 4⅛% Deb. 2/1/65
180M	Federal Land Banks 4¼% Bonds 7/20/66
180M	Federal Land Banks 4¼% Bonds 4/20/65
79M	Federal Land Banks 4% Bonds 12/20/65
130M	Federal Land Banks 4¼% Bonds 3/20/68
200M	Federal Land Banks 4⅜% Bonds 3/20/69
50M	Federal Land Banks 3½% Bonds 5/1/71
100M	Federal Land Banks 4½% Bonds 2/20/74
35M	Federal National Mortgage Association 3⅞% Deb. 12/11/64
10M	Federal National Mortgage Association 4⅜% Deb. 6/10/65
120M	Federal National Mortgage Association 3⅝% Deb. 3/11/68
300M	Federal National Mortgage Association 4⅛% Deb. 9/10/70
	Other
112M	Alabama Power Co. 4⅛% Mtge. 5/1/83
50M	Alabama Power Co. 3⅛% Mtge. 3/1/84
75M	Alabama Power Co. 3½% Mtge. 6/1/85
50M	Alabama Power Co. 4⅝% Mtge. 5/1/87
50M	Alabama Power Co. 3⅞% Mtge. 1/1/88
125M	Alabama Power Co. 4⅞% Mtge. 5/1/89
200M	Allied Chemical Corp. 3½% Deb. 4/1/78
50M	Aluminum Co. of America 3¾% Deb. 4/1/83
54M	American Can Co. 4¾% Deb. 7/15/90
50M	American Telephone & Telegraph Co. 2¾% Deb. 2/1/71
70M	American Telephone & Telegraph Co. 3¼% Deb. 9/15/84
200M	American Telephone & Telegraph Co. 4⅜% Deb. 4/1/85
230M	American Telephone & Telegraph Co. 3⅝% Deb. 7/1/90
200M	American Telephone & Telegraph Co. 4⅜% Deb. 5/1/99
50M	Appalachian Electric Power Co. 3½% Mtge. 12/1/83
100M	Appalachian Electric Power Co. 4⅝% Mtge. 3/1/87

Duke University Investments (Continued)

Bonds Par Value	
50M	Arkansas Power & Light Co. 4⅜% Mtge. 2/1/93
98M	Armco Steel Corp. 4.35% Deb. 4/1/84
50M	Armco Steel Corp. 4½% Deb. 6/1/86
70M	Atlantic Refining Co. 3¼% Deb. 1/15/79
100M	Automatic Canteen Co. 4¾% Deb. 7/1/81
50M	Bell Telephone Co. Pennsylvania 4⅜% Deb. 2/1/2003
50M	Boston Edison Co. 4⅝% Mtge. 6/1/87
11M	C. I. T. Financial Corp 3⅞% Notes 7/1/64
180M	C. I. T. Financial Corp. 3⅞% Notes 10/7/64
600M	C. I. T. Financial Corp. 4.165702% Notes 10/9/64
350M	C. I. T. Financial Corp. 3⅞% Notes 11/2/64
179M	C. I. T. Financial Corp. 3⅞% Notes 11/30/64
100M	C. I. T. Financial Corp. 4% Notes 1/11/65
50M	C. I. T. Financial Corp. 4¾% Deb. 7/1/66
40M	C. I. T. Financial Corp. 3⅝% Deb. 9/1/70
100M	C. I. T. Financial Corp. 4⅝% Deb. 1/1/79
130M	C. I. T. Financial Corp. 5⅛% Deb. 1/15/80
65M	C. I. T. Financial Corp. 4½% Deb. 9/1/84
125M	Carolina Power & Light Co. 3½% Mtge. 10/1/82
100M	Carolina Power & Light Co. 4½% Mtge. 11/1/91
50M	Central Illinois Light Co. 4⅝% Mtge. 7/1/87
100M	Central Illinois Light Co. 4⅞% Mtge. 3/1/90
50M	Central Illinois Public Service Co. 3⅜% Mtge. 9/1/77
200M	Central Illinois Public Service Co. 4¾% Mtge. 1/1/89
100M	Central Power & Light Co. 4¾% Mtge. 4/1/89
50M	Champion Paper and Fibre Co. 3¾% Deb. 7/15/81
50M	Chesapeake & Potomac Telephone Co. 4⅜% Deb. 2/1/98
50M	Cincinnati Gas & Electric Co. 4⅛% Mtge. 5/1/87
50M	Columbus & Southern Ohio Electric Co. 3¾% Mtge. 4/1/86
160M	Commercial Credit Co. 3⅞% Notes 7/6/64
200M	Commercial Credit Co. 3⅞% Notes 7/14/64
30M	Commercial Credit Co. 3⅞% Notes 8/12/64
15M	Commercial Credit Co. 3⅞% Notes 9/21/64
80M	Commercial Credit Co. 3⅞% Notes 11/10/64
64M	Commercial Credit Co. 3⅞% Notes 12/9/64
20M	Commercial Credit Co. 3⅝% Notes 2/1/76
50M	Commercial Credit Co. 5% Notes 6/1/77
70M	Commercial Credit Co. 4¾% Notes 11/1/80
50M	Commonwealth Edison Co. 4¼% Mtge. 3/1/87
97M	Commonwealth Edison Co. 4⅜% Deb. 1/1/2009
75M	Consolidated Edison Co. of N. Y. 3½% Mtge. 2/1/83
75M	Consolidated Edison Co. of N. Y. 3⅜% Mtge. 1/1/84
50M	Consolidated Edison Co. of N. Y. 3⅝% Mtge. 5/1/86
100M	Consolidated Edison Co. of N. Y. 4¼% Mtge. 10/1/86
50M	Consolidated Edison Co. of N. Y. 5% Mtge. 10/1/87
100M	Consolidated Edison Co. of N. Y. 4⅝% Mtge. 11/1/91
200M	Consolidated Edison Co. of N. Y. 4⅜% Mtge. 10/1/92
44M	Consolidated Natural Gas Co. 4⅞% Deb. 6/1/82
45M	Consolidated Natural Gas Co. 5% Deb. 9/1/82
100M	Consolidated Natural Gas Co. 4⅜% Deb. 2/1/86
100M	Consolidated Natural Gas Co. 4¾% Deb. 5/1/86
50M	Consolidated Natural Gas Co. 4⅜% Deb. 4/1/88
27M	Consumers Power Co. 4⅜% Deb. 8/15/75
50M	Consumers Power Co. 4% Mtge. 8/1/86
12M	Consumers Power Co. 4¾% Mtge. 10/1/87
50M	Consumers Power Co. 4½% Mtge. 10/1/88
100M	Consumers Power Co. 3¼% Mtge. 2/1/90
45M	Delaware Power and Light Co. 3⅞% Mtge. 6/1/88
50M	Detroit Edison Co. 3¼% Mtge. 5/15/80

Duke University Investments (Continued)

Bonds Par Value	
100M	Diamond State Telephone Co. 4¾% Deb. 4/1/94
200M	Duke Power Co. 3% Mtge. 1/1/75
500M	Duke Power Co. 2.65% Mtge. 9/1/77
337M	Duke Power Co. 4⅞% Deb. 9/1/82
100M	Duke Power Co. 3⅝% Mtge. 5/1/86
600M	Duke Power Co. 4¼% Mtge. 8/1/92
50M	Duquesne Light Co. 3⅝% Mtge. 9/1/83
50M	Duquesne Light Co. 3½% Mtge. 4/1/86
9M	Durham Investment Corp. 5% Deb. 12/31/77
2.5M	Florida East Coast Railway Co. 5% Mtge. 1/1/2011
2.5M	Florida East Coast Railway Co. 5½% Mtge. 1/1/2011
50M	General Electric Co. 3½% Deb. 5/1/76
60M	General Motors Acceptance Corp 3¾% Notes 9/29/64
38M	General Motors Acceptance Corp. 3⅞% Notes 10/7/64
100M	General Motors Acceptance Corp. 3⅞% Notes 11/2/64
200M	General Motors Acceptance Corp. 4% Notes 11/10/64
40M	General Motors Acceptance Corp. 4% Notes 11/12/64
37M	General Motors Acceptance Corp. 4% Notes 1/6/65
13M	General Motors Acceptance Corp. 4% Notes 1/22/65
44M	General Motors Acceptance Corp. 4% Notes 2/10/65
100M	General Motors Acceptance Corp. 3% Deb. 7/15/69
125M	General Motors Acceptance Corp. 3½% Deb. 3/15/72
100M	General Motors Acceptance Corp. 4⅝% Deb. 9/1/82
150M	General Motors Acceptance Corp. of Canada, Ltd. 4¾% Deb. 1/15/68
50M	General Motors Acceptance Corp. of Canada, Ltd. 4¾% Deb. 12/15/69
150M	General Motors Corp. 3¼% Deb. 1/1/79
100M	Georgia Power Co. 3⅜% Mtge. 7/1/82
55M	Georgia Power Co. 3¾% Mtge. 4/1/83
100M	Georgia Power Co. 3⅛% Mtge. 4/1/84
75M	Georgia Power Co. 3⅜% Mtge. 5/1/85
50M	Georgia Power Co. 3⅝% Mtge. 4/1/86
37M	Georgia Power Co. 5¼% Mtge. 6/1/87
50M	Gulf States Utilities Co. 3⅛% Mtge. 12/1/82
100M	Gulf States Utilities Co. 3⅜% Mtge. 12/1/83
50M	Gulf States Utilities Co. 4⅞% Mtge. 10/1/87
200M	Gulf States Utilities Co. 4¾% Mtge. 1/1/89
100M	Gulf States Utilities Co. 5¼% Mtge. 12/1/89
75M	Houston Lighting & Power Co. 4¾% Mtge. 11/1/87
95M	Idaho Power Co. 4½% Mtge. 10/15/88
100M	Illinois Bell Telephone Co. 4⅜% Mtge. 3/1/94
100M	Illinois Power Co. 3½% Mtge. 11/1/83
50M	Illinois Power Co. 3¾% Mtge. 7/1/86
50M	Illinois Power Co. 4% Mtge. 5/1/88
50M	Imperial Oil, Ltd. 3⅝% Deb. 2/1/75
50M	Inland Steel Co. 3½% Mtge. 7/1/81
47M	Inland Steel Co. 4⅜% Mtge. 7/1/87
181M	Inland Steel Co. 4½% Mtge. 2/1/89
100M	Iowa Illinois Gas & Electric Co. 4⅞% Mtge. 5/1/91
100M	Kansas City Power & Light Co. 3¼% Mtge. 1/15/83
75M	Long Island Lighting Co. 3⅜% Mtge. 10/1/82
125M	Long Island Lighting Co. 3¼% Mtge. 12/1/84
100M	Long Island Lighting Co. 4⅛% Mtge. 5/1/88
98M	P. Lorillard Co. 3¾% Deb. 4/1/78
100M	P. Lorillard Co. 4⅞% Deb. 6/1/86
50M	Louisville Gas and Electric Co. 4⅞% Mtge. 9/1/87
100M	May Department Stores Co. 3¼% Deb. 2/1/78
250M	Michigan Bell Telephone Co. 4⅜% Deb. 12/1/91
60M	Michigan Bell Telephone Co. 4¾% Deb. 11/1/92
50M	Honeywell, Inc. 3¾% Deb. 8/1/76

Duke University Investments (Continued)

Bonds Par Value	
100M	Monongahela Power Co. 4¾% Mtge. 4/1/84
50M	Montana Power Co. 2⅞% Mtge. 10/1/75
200M	Montana Power Co. 4½% Mtge. 4/1/89
180M	Mountain States Telephone & Telegraph Co. 4⅜% Deb. 2/1/88
60M	National Steel Corp. 3⅞% Mtge. 11/1/86
50M	New England Power Co. 3¼% Mtge. 1/1/85
100M	New England Power Co. 4⅝% Mtge. 11/1/91
100M	New England Telephone & Telegraph Co. 3¼% Deb. 12/15/77
50M	New England Telephone & Telegraph Co. 3⅛% Deb. 12/15/88
125M	New Jersey Bell Telephone Co. 3⅞% Deb. 4/1/93
60M	New York State Electric & Gas Corp. 3⅜% Mtge. 9/1/85
100M	New York Telephone Co. 4½% Mtge. 5/15/91
50M	New York Telephone Co. 3⅜% Mtge. 4/1/96
75M	Niagara Mohawk Power Corp. 3½% Mtge. 2/1/83
50M	Niagara Mohawk Power Corp. 3⅝% Mtge. 5/1/86
50M	Niagara Mohawk Power Corp. 4⅞% Mtge. 9/1/87
50M	Niagara Mohawk Power Corp. 3⅞% Mtge. 6/1/88
100M	Northern Indiana Public Service Co. 4½% Mtge. 1/15/89
49M	Northern States Power Co. 4⅝% Mtge. 6/1/87
200M	Northwestern Bell Telephone Co. 4⅜% Deb. 3/1/2003
65M	Ohio Edison Co. 3¼% Mtge. 1/1/84
150M	Ohio Edison Co. 4½% Mtge. 4/1/89
125M	Ohio Power Co. 3⅜% Mtge. 1/1/83
50M	Ohio Power Co. 4¼% Mtge. 11/1/86
200M	Ohio Power Co. 4⅝% Mtge. 4/1/89
120M	Pacific Gas & Electric Co. 3⅛% Mtge. 6/1/84
35M	Pacific Gas & Electric Co. 4½% Mtge. 12/1/86
50M	Pacific Gas & Electric Co. 3⅜% Mtge. 12/1/88
50M	Pacific Gas & Electric Co. 5% Mtge. 6/1/89
100M	Pacific Telephone & Telegraph Co. 3¼% Deb. 11/15/79
50M	Pacific Telephone & Telegraph Co. 5⅛% Deb. 8/1/80
250M	Pacific Telephone & Telegraph Co. 4⅜% Deb. 8/15/88
150M	Pacific Telephone & Telegraph Co. 3⅛% Deb. 11/15/89
200M	Pacific Telephone & Telegraph Co. 4⅝% Deb. 11/1/90
100M	Pennsylvania Power & Light Co. 4⅝% Mtge. 12/1/91
115M	Philadelphia Electric Co. 3⅛% Mtge. 4/1/85
20M	Phillips Petroleum Co. 4¼% Conv. Deb. 2/15/87
100M	Pillsbury Mills, Inc. 3⅛% Deb. 12/1/72
50M	Plantation Pipe Line Co. 3½% Deb. 4/1/86
60M	Province of Ontario, Canada 3¼% Deb. 9/1/72
200M	Province of Ontario, Canada 3¼% Deb. 2/1/75
75M	Province of Ontario, Canada 3⅛% Deb. 3/15/80
200M	Province of Ontario, Canada 4¾% Deb. 2/1/84
55M	Public Service Co. of Indiana, Inc. 3⅜% Mtge. 1/1/84
200M	Public Service Co. of Indiana, Inc. 4⅜% Mtge. 2/1/89
50M	Public Service Electric & Gas Co. 3¼% Mtge. 5/1/84
200M	Public Service Electric & Gas Co. 4⅝% Mtge. 8/1/88
196M	San Diego Gas & Electric Co. 4⅝% Deb. 1/15/84
30M	Scarsdale Golf Club, Inc. 4% Bonds 12/1/74
30M	Sinclair Oil Corp. 4⅜% Conv. Deb. 12/1/86
50M	Southern Bell Telephone & Telegraph Co. 4% Deb. 10/1/83
150M	Southern Bell Telephone & Telegraph Co. 4⅝% Deb. 12/1/93
100M	Southern Bell Telephone & Telegraph Co. 4⅜% Deb. 3/1/98
50M	Southern California Edison Co. 3⅝% Mtge. 8/15/78
59M	Southern California Edison Co. 3⅜% Mtge. 4/15/81
40M	Southern California Edison Co. 4¼% Mtge. 2/15/82
48M	Southern California Edison Co. 4¾% Mtge. 7/1/82
50M	Southern California Edison Co. 4⅞% Mtge. 9/1/82
75M	Southern California Edison Co. 4⅜% Mtge. 9/1/85

Duke University Investments (Continued)

Bonds Par Value	
100M	Southern California Edison Co. 4½% Mtge. 4/1/86
70M	Southern California Edison Co. 4⅜% Mtge. 5/15/88
100M	Southern California Gas Co. 3⅞% Mtge. 6/1/81
50M	Southern New England Telephone & Telegraph Co. 3⅛% Deb. 3/1/78
50M	Sterling Drug Co., Inc. 3¼% Deb. 4/1/80
50M	Superior Oil Co. 3¾% Deb. 7/1/81
50M	Tampa Electric Co. 4¼% Mtge. 7/1/88
37M	Tennessee Gas Transmission Co. 6% Deb. 11/1/77
50M	Union Electric Co. 3¾% Mtge. 7/1/86
100M	Union Electric Co. 4⅜% Mtge. 3/1/88
50M	United States Steel Corp. 4% Deb. 7/15/83
200M	United States Steel Corp. 4½% Deb. 4/15/86
50M	Utah Power & Light Co. 3½% Mtge. 10/1/82
50M	Virginia Electric & Power Co. 4⅛% Mtge. 10/1/86
100M	Virginia Electric & Power Co. 4½% Mtge. 12/1/87
100M	Virginia Electric & Power Co. 4⅞% Mtge. 6/1/91
50M	Washington Water Power Co. 4⅞% Mtge. 7/1/87
50M	West Penn Power Co. 4⅞% Mtge. 7/1/87
25M	West Virginia Pulp & Paper Co. 4% Deb. 1/1/78
50M	Wisconsin Electric Power Co. 3¾% Mtge. 4/15/86
100M	Wisconsin Power & Light Co. 4⅜% Mtge. 3/1/89
50M	Wisconsin Telephone Co. 4½% Deb. 7/1/92

Stocks No. of Shares	
10,626	Alleghany Power System, Inc.
300	Allied Chemical Corp.
30,000	Aluminium, Ltd.
6,000	Amerada Petroleum Corp.
11,000	American Cyanamid Co.
6	American Educational Life Ins. Co.
412	American Electric Power Co., Inc.
26,082	American Telephone & Telegraph Co.
650	American Tobacco Co. 6% Cum. Pfd.
2,000	Ampex Corp.
11,000	Avco Corp.
18,000	Baltimore Gas & Electric Co.
333	Bankers Trust Co.
8,000	Borg-Warner Corp.
5,000	Bristol-Myers Co.
100	Business Development Corp. of North Carolina
14,000	C. I. T. Financial Corp.
2,100	Campbell Soup Co.
1,505	Cannon Mills Co.
2,605	Cannon Mills Co. B
6,010	Carolina Power & Light Co.
210	Carolina Telephone & Telegraph Co.
4,000	Champion Papers Inc.
3,978	Chase Manhattan Bank
9,200	Chemical Bank New York Trust Co.
25,532	Cincinnati Gas & Electric Co.
3,600	Coca-Cola Co.
400	Commercial Credit Co.
11,295	Commonwealth Edison Co.
5,200	Consolidated Edison Co. of N. Y., Inc.
10,028	Consumers Power Co.
15,000	Container Corp. of America

Duke University Investments (Continued)

Stocks

No. of Shares	
14,000	Continental Illinois National Bank & Trust Co. of Chicago
3,000	Continental Oil Co.
800	Corn Products Co.
15,189	Dayton Power & Light Co.
10	Denny Roll & Panel Co.
5,000	Detroit Edison Co.
5,000	The Dow Chemical Co.
114,000	Duke Power Co.
4,100	E. I. DuPont de Nemours & Co.
800	Duquesne Light Co.
600	Durham Investment Corp.
9,030	Eastman Kodak Co.
3,500	F. M. C. Corporation
500	El Paso Natural Gas Co. 5.5% Pfd.
5,000	Fidelity Philadelphia Trust Co.
7,144	First National Bank of Boston
7,732	First National City Bank of N. Y.
160	Florida East Coast Railway Co.
11,000	General Electric Co.
3,000	General Foods Corp.
610	General Motors Corp.
3,336	General Motors Corp. $5 Pfd.
4,500	General Telephone & Electronics Corp.
5,800	Gillette Co.
2,000	Ginn and Co.
9,852	Gulf Oil Corp.
5,655	P. H. Hanes Knitting Co.
11,800	Indianapolis Power & Light Co.
4,000	Ingersoll Rand Co.
1,500	Inland Steel Co.
9,050	International Business Machines Corp.
500	International Harvester Co.
6,200	International Nickel Co. of Canada, Ltd.
7,140	International Paper Co.
5,500	International Telephone & Telegraph Corp.
5,555	J. B. Ivey & Co.
4,122	J. A. Jones Construction Co. 5% Pfd.
13,400	Kansas City Power & Light Co.
3,500	Liggett & Myers Tobacco Co.
4,000	Link Belt Co.
1,000	Litton Industries, Inc. 3% Pfd.
7,000	Lockheed Aircraft Corp.
30	Long Meadow Farms Cooperative, Inc. 5% Cum. Pfd.
7,000	P. Lorillard Co.
7,900	Louisiana Land & Exploration Co.
6,000	Louisville Gas & Electric Co.
3,000	The Magnavox Co.
6,252	Manufacturers Hanover Trust Co.
10,500	Merck & Co., Inc.
6,000	Middle South Utilities, Inc.
2,000	Honeywell, Inc.
10,406	Monsanto Co.
14,850	Morgan Guaranty Trust Co. of N. Y.
1,500	National Cash Register Co.
7,000	National Lead Co.
3,000	National Steel Corp.
9,856	New York State Electric & Gas Corp.
3,150	North Carolina National Bank & Trust Co.
11,400	Ohio Edison Co.

Duke University Investments (Continued)

Stocks *No. of Shares*	
7,000	Owens Illinois Glass Co.
14,600	Pacific Gas & Electric Co.
200	Pacific Lighting Corp. $4.36 Pfd.
3	Pamlico Power & Light Co., Inc. 5% Pfd.
2,000	The Permian Corp.
15,436	Philadelphia Electric Co.
4,000	Phillips Petroleum Co.
5,000	Procter & Gamble Co.
116,100	R. J. Reynolds Tobacco Co. B
2,300	Shell Oil Co.
5,000	Socony Mobil Oil Co., Inc.
4,000	The Southern Co.
340	Spindale Mills, Inc.
3,150	Standard Oil Co. of California
1,500	Standard Oil Co. (Indiana)
20,989	Standard Oil Co. (New Jersey)
31,236	Texaco, Inc.
1,000	Texas Eastern Transmission Corp. 5% Pfd.
3,000	Texas Instruments, Inc.
2,500	Union Carbide Corp.
7,500	United Aircraft Corp.
1,000	United States Steel Corp.
2,475	Wachovia Bank & Trust Co.

GIFTS AND BEQUESTS

Duke University derives its principal support from endowment funds and from miscellaneous gifts and grants. Permanently invested capital funds enable the University to offer to students academic and professional training at a fraction of its actual cost. The effectiveness of the University is determined to a large extent by its financial resources.

Gifts and bequests devoted to the improvement of the work of the University will be received and administered by the Trustees in accordance with the desires of the donor.

GIFTS. Any kind of property, real or personal, may be the subject of a gift and only such form as is required to pass title is necessary. If the gift consists of real property, the title will be passed by deed; if it consists of cash or unregistered bonds, the gift is consummated by delivery of the property; or if stocks, by delivery of properly endorsed stock certificates. Unless restricted, the use of gifts is at the discretion of the Board of Trustees. Usually the proceeds, conservatively invested, are added to the permanent endowment of the University. The donor may, however, restrict the use of any gift and designate definitely the object for which it shall be used. In such cases, the transfer of property should be accompanied by a letter or other document describing in detail the objects for which the proceeds of the gift are to be used and when accepted by the University the terms or conditions set out therein become binding upon it.

BEQUESTS. Bequests may be made to the University by an appropriate clause inserted in a will or by codicil to a will already drawn. The forms shown on the following page will serve as appropriate clauses for wills or codicils.

FORMS FOR BEQUESTS

General

I give, devise and bequeath to Duke University, a corporation existing under the laws of the State of North Carolina and located in the City and County of Durham, State of North Carolina, and its successors forever, the sum of.....

.....Dollars

(or otherwise describe the gift) for the general purposes and uses of the University at the discretion of the Board of Trustees.

Specific

I give, devise and bequeath to Duke University, a corporation existing under the laws of the State of North Carolina and located in the City and County of Durham, State of North Carolina, and its successors forever, the sum of.....

.....Dollars

(or otherwise describe the gift) and direct that the income therefrom shall be used for the following purposes, viz. (here describe in detail the use desired).

Codicil

Having hereinbefore made my last Will and Testament dated.....

....., and being of sound mind, I hereby make, publish, and declare the following codicil thereto; (here insert clause in same form as if it had been included in body of Will). Except as hereinbefore changed, I hereby ratify, confirm and republish my said last Will and Testament.

(It is strongly recommended that a competent lawyer be employed to prepare the will and to supervise its execution in order to comply with all the requirements of the law of the state in which the maker of the will resides. It is also wise to give the University considerable latitude in the use of any fund so that a change of circumstances may not impair the usefulness of the gift. The Treasurer of the University will be glad upon request to review the phrasing of any proposed form of bequest.)

Studying Law at Duke



BULLETIN OF DUKE UNIVERSITY

"I have selected Duke University as one of the principal objects of this trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical, lines, is, next to religion, the greatest civilizing influence. I request that this institution secure for its officers, trustees and faculty men of such outstanding character, ability and vision as will insure its attaining and maintaining a place of real leadership in the educational world, and that great care and discrimination be exercised in admitting as students only those whose previous record shows a character, determination and application evincing a wholesome and real ambition for life. **And I advise that the courses at this institution be arranged, first, with special reference to the training of preachers, teachers, lawyers and physicians, because these are most in the public eye, and by precept and example can do most to uplift mankind, . . .**"

(From the Indenture of James B. Duke)

Studying Law at Duke



The Duke Chopel, in the heart of the Gothic Compus, is an outstonding monument of its kind.

Bulletin of Duke University

Volume 37 September 1964 Number 2-A

PUBLISHED BY DUKE UNIVERSITY MONTHLY EXCEPT IN JULY, AUGUST, SEPTEMBER, AND DECEMBER. ENTERED AS SECOND-CLASS MATTER MARCH 25, 1929, AT THE POSTOFFICE OF DURHAM, NORTH CAROLINA, UNDER THE ACT OF AUGUST 24, 1912

Are You Considering

The Study of Law?

IF you have ambition, intelligence and confidence in your ability to succeed, probably you have already thought of studying law, especially if you aspire to rewards beyond those merely financial. Few careers offer greater satisfaction than success in the law.

The study of law is *not* for those seeking great wealth with little effort. It *is* a career for those of superior ability and character who are willing to reap in proportion to their efforts.

If law is taught in the "grand manner," it provides a liberal education one that cuts across so many fields o human activity and human relation that those who pursue it may ap proach that Renaissance ideal of the "Universal Man."

The study of law leads to many diverse opportunities. For some ca reers it is the means of entry. Fo



The spot-lighted Chapel at night is a dramatic and inspiring sight.

Turn this page for a look at a typical Duke Law School entering class.

(We try to limit entering classes to 100 students, but this one had a few more)

33% from the norteastern states
30% from the southern states
26% from the middle western states
11% from the far western states

others it is a stepping stone to more rapid advancement.

Perhaps already you have decided to practice law, or perhaps you are seeking a career in government, with a large corporation or in a family owned business, in education or in communications. Duke law graduates include leaders in all of these fields.

IF YOU like to help people, if you can be constructive in dealing with problems, troubles, and dilemmas, then you may do well to consider the law as a profession. Helping people is a lawyer's daily work, solving problems his professional responsibility, and trouble the reason for his existence.

Law offers opportunities to people of varied talents, so heterogeneous is its practice. You may have no talent for courtroom dramatics, and yet you may succeed as a tax specialist, estate planner, or organizational strategist. If you are excellent at written argument but less adept at oral argument, you can still fit effectively into a partnership team. There are many different kinds of practices and specialities. Civil and criminal litigation, corporation law, estate law, taxation and labor relations are but a few. There are many sizes of law offices from the one-man office to those with over one hundred lawyers. If you possess the basic qualifications, then somewhere there is a place that will suit your temperament and ability.

A good lawyer will find his earnings growing each year. Unlike other pursuits, where peak earning power may be reached at the age of 35, a lawyer will find his earnings much greater at 45, better still at 55, and still growing at 65, if he chooses to remain active.

Yes, the legal profession offers you a challenge and a great opportunity. Duke University School of Law offers a chance to seek and meet that opportunity.







Moot court trials give practice in courtroom give and take.

Do You Have

A Lawyer's Qualifications?

Some of the qualities that a lawyer must possess have already been touched upon. There are others.

"Talk, talk, talk! Why, this boy talks so much that, I declare, he ought to be a lawyer." This is a crude conception, unfortunately all too prevalent, of the qualifications for a lawyer. Members of the profession are apt to overhear such remarks with mingled amusement and resentment.

True, if you are going to be a lawyer you should be articulate, but this does not mean garrulous. You should be articulate with pen as well as with the spoken word. The law is no profession for the illiterate. The ability to express oneself with a few intelligently chosen words, selected after solid analysis and grammatically and artistically presented, is a great asset. This involves the ability to read intelligently, because a lawyer constantly turns to legal literature (and non-legal as well) for information and ideas. A limited vocabulary is a handicap.

It is needless to say that another prime requisite is the ability to think clearly.

Every leading lawyer with whom you will ever talk will also emphasize this point: character and integrity lead the list of virtues that a lawyer must possess. The young lawyer from the very beginning must so conduct himself that no breath of suspicion can be associated with his conduct. He will be observed by everyone, and in particular by other lawyers. One wrong ethical move at the start of his career and he is immediately pigeonholed as a man to bear watching, not to be trusted. Such a reputation is a tremendous handicap to success and satisfaction in any field and particularly so in law. One of the lawyer's greatest assets is his ability to inspire confidence. When a client leaves the office, that client should say to himself: "I know that my problem is in honest, capable and conscientious hands."

Naturally, personal appearance, dress, speech and manners have a definite bearing on inspiring confidence.

Finally, you should know that the willingness and ability to work hard is essential. If you aspire to the 25-hour week, don't be a lawyer. For one thing, no respectable lawyer would want to work that little—law practice is too interesting. Good, solid, hard work counts for more in the long run than occasional flashes of genius. If, on assessing yourself, you conclude that you are not "brilliant," that does not necessarily mean that you cannot be a successful lawyer. Many a "genius" has been surpassed in the practice of law by others less brilliant but with more of the prosaic virtues, including plain horse sense and good judgment.



On Televisian—Seated on stage at the Caspary Auditarium af The Rackefeller Institute, members af "The Great Challenge," symposium "The Changing Potterns of aur Politicol System": **Arthur Larson, Director of World Rule of Law Center, Duke Law School;** Dr. Richard Neustodt, Prafessor af Government, Columbio University; Senotor Barry M. Galdwoter, R-Arizana; Gavernar Michael V. DiSalle af Ohio; Richord Ravere, carrespondent far The New Yorker Magozine; moderatar Haword K. Smith, CBS News Washingtan Correspandent.

How Should You

Prepare for Law School?

What college courses should you take if you are going to law school?

One can point to no single course in college and say that *that* is a "must" in pre-law study. Nor can one say that there is any single "major" which opens the way for success in law study or law practice. Success has been achieved in law school and in law practice by students who have majored in mathematics, English, history, economics, philosophy, political science, Latin, foreign languages, the physical sciences, and even those with degrees in engineering or business administration.

In general, if you are going to law school, you can afford to pass up those courses which include the word "law" in their names, but this statement does not apply to college courses in constitutional law or international law when studied from the point of view of the political scientist.

Take the tough courses in college, those that make you think and work. Avoid the "snap" courses.

In general, avoid the "vocational" courses. Stick to the fields which traditionally have been looked upon as the mark of the educated man. You will recognize them among those fields already mentioned, although they are by no means limited to those fields. Mathe-

Classroom wing of new Law Building.





Section of Library Reading Room, new Law Building.

matics encourages you to think logically. English courses should help you to become articulate and literate—especially, some say, the English writing courses. Latin and modern languages instill discipline and accuracy—and incidentally teach you a great deal about your own language. History, putting you in contact with the culture and achievements of the ages, enables you to understand your heritage and assess current institutions. Philosophy challenges you to inquire, question, speculate. Political science, economics and sociology broaden your horizon, make you better able to appreciate the world in which you live. None of these subjects will make you a technician who, as such, can sell his services for a higher price. But you will be a better practitioner in the learned professions for having chosen them over the vocational courses. (Accounting, properly taught, can well be part of a liberal education.)

Selecting Your Law School

Any attempt to classify law schools is inherently arbitrary and is bound to be far from definitive. It is, however, customary to regard the better schools as either "national" or "state" and as large or small. This disregards those unaccredited schools, not affiliated with any strong university, which frequently are operated merely as profit-making ventures and do not merit your consideration. In this connection it should be emphasized that law is a profession in which only the superior practitioner stands a high chance of success, and you should not handicap yourself with an inferior legal education.

Although any sacrifice is worth making to attend one of the best schools, paradoxically the best often costs the least for the superior student eligible for financial aid.

A national law school is one whose student body is not predominantly from the state in which it is located. This in turn means that the sphere of the school extends beyond the state. A by-product is that its graduates are pretty well scattered over the nation.

The Duke Law School is in the "national" group and, accordingly, its instruction is directed to the legal principles that underlie what lawyers and judges do in all sections of our country and elsewhere in the common law world, i.e., the British Commonwealth. (And often in other countries.) One might be led to believe that a local law school better prepares its students for success in local law practice. Actually, the evidence does not support such belief. One advantage of the national law school is that its graduates enjoy a wide market where it comes to making professional connections upon graduation.

The distinction between the "large" and the "small" law school relates mainly to the number of law students. Each type of school has certain advantages. The mass production and cold impersonality of the large schools, it can be argued, provide good preparation for what you can expect in our mass urban civilization. Arguably, students at such a school learn from each other by a cross fertilization of many minds. In fact, however, a student gets to know only a few other students at such a place and they tend to form small groups; the cross-fertilization, except in the class room, is thus within a very limited group after all. And in the large class room, the students at the back of the room may get very little benefit from a discussion going on be-



The dean cons
regularly with e
student—here ab
employment oppo
nities, but often ab
many other thir



Informal discussion in a small class: Professor O'Neal's Carporate Planning seminar.

tween the professor and a student in the front row. In the smaller law school, you get to know every man in your class and frequently most of the students in the other classes—or at least you get the chance to do so if you make the effort. You feel free to start a legal argument any time, with any one of them. In the smaller law school you can get to know your professors; your professors can get to know you.

You can acquire a very good legal education at either a top-flight large school or a top-flight small school. It is largely a question of suiting your taste and temperament.

One warning to you, however: Discount the lavish praise that you will always hear of each and every law school within a radius of a few miles from its location! For some inexplicable reason an intense provincialism exists with respect to law schools. You will be solemnly told, within this radius, that here is the greatest law school in the world, or at the least it may be grudgingly conceded that it is number two. If you ask a lawyer, he will tell you that the institution which he attended is the greatest of them all. Lawyers can be helpful to you in your selection of a law school if you will just make it clear to them that their alma mater is to be left out of the discussion.

and

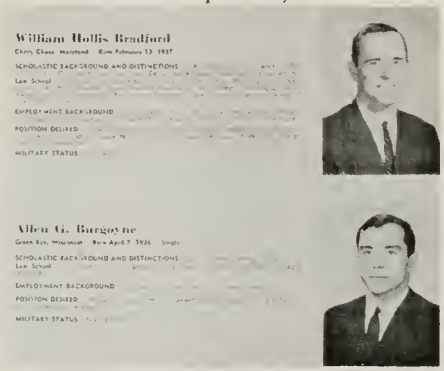
After Duke Law School, Then What?

Placement of its students is one of Duke Law School's most successful achievements. Close contact is kept by the Dean and the Assistant Dean with outstanding law firms over the country.

Notwithstanding the many other opportunities available to Duke Law students upon graduation, they seem to prefer the private practice of law. Their preferences in this respect run to the law firms in the larger cities of the nation and include all major geographical areas. The national distribution of the School's graduates in large measure reflects the wide geographical sources of the incoming students.

Naturally, a student who stands high in his class finds himself in more of a "seller's market" than one who stands low, other factors being equal. (Which they never are.) Even so, we are constantly gratified at how far down a Duke Law School class the top flight law firms of every region are willing to go for young and promising legal talent.

Duke was the first law school to initiate the *placement bulletin,* an idea since adopted by a number of other schools. The *placement bulletin,* which is under the editorial supervision of the students themselves, lists the members of the senior class with their pictures and relevant biographical data. (A representative page from that bulletin is here reproduced.) The placement bulletin is widely circulated among law offices, government offices and business offices and has proved to be an effective part of our placement program.


William Hollis Bradford

Chevy Chase, Maryland Born February 13 1927

SCHOLASTIC BACKGROUND AND DISTINCTIONS

Law School

EMPLOYMENT BACKGROUND

POSITION DESIRED

MILITARY STATUS

Allen G. Burgoyne

Green Bay, Wisconsin Born April 7 1926 Single

SCHOLASTIC BACKGROUND AND DISTINCTIONS

Law School

EMPLOYMENT BACKGROUND

POSITION DESIRED

MILITARY STATUS

Most of the placement activity is in the third year, but we also cooperate fully with the students in canvassing potentials for the so-called "summer internship," for the summer following the second year of law study.



Principal participonts in the 1963 Low Doy-Dedicotian exercises: Pravast R. Taylor Cole; Professar Wolter Gellhorn, President af the Associotian af Americon Low Schoals; Mr. Chorles S. Rhyne, former President, Americon Bor Assaciotion; Chief Justice Eorl Worren; Senotor John Shermon Caaper; Salicitor Generol Archibold Cax; and Dean Latty.

Duke Law School celebrates its annual Law Day on a weekend close to the National Law Day U. S. A. The Duke Bar Association plays an important role in planning and carrying out the program of activities for the occasion. Speakers of national prominence and panel discussions of topics of importance to the profession typically are features of the celebration.

A panel af taxotian law experts fram voriaus sectians af the cauntry, oll Duke Law graduates, discuss strategy and toctics in tax coses for on audience compased af Duke Law students as well as procticing lawyers from for and wide. Left to right: Hugh G. Isley '53, J. Carltan Fleming '51, Leon L. Rice '36, and Numo L. Smith '41.





LATTY

ELVIN R. LATTY, B.S., Bowdoin College; J.D., University of Michigan; J.Sc.D., Columbia University; general practice, 1930-1933; Associate Professor of Law, University of Kansas, 1934-1935; Professor of Law, University of Missouri, 1935-1937; Special Assistant to the American Ambassador, Caracas, 1942-1943; Acting Assistant Chief, Foreign Funds Control Division, Department of State, 1943; Fulbright Lecturer, University of Pavia (Italy) 1954; Faculty since 1937, and Dean.



BAADE

HANS W. BAADE, A.B., Syracuse University; Dr. iur. 1951, University of Kiel, Germany; LL.B., LL.M., 1955, Duke University; Diploma, 1956, Hague Academy of International Law. *Assistent*, 1955, and *Referent*, 1956-59, Institute of International Law at the University of Kiel, Germany; Editorial Secretary, Jahrbuch für Internationales Recht; Faculty since 1960.



BOLICH

W. BRYAN BOLICH, A.B., Duke University; B.A. (Juris.), B.C.L., M.A., Oxford University; general practice 1924-1927; Legal Attaché, American Embassy, Rome, 1950; Faculty since 1927.



BRYSON

EDWIN C. BRYSON, University of North Carolina, 1922-1925; Duke University, 1932-1933; LL.B., University of Oregon; general practice, 1927-1930; Duke University Counsel since 1945; Faculty since 1947.

The Law Faculty at Duke University

An outstanding faculty of efficient size and a student body of high quality are the hallmarks of a first-rank law school. Besides maintaining a high ratio of law faculty to students, with emphasis placed on individualized instruction, the Duke Law School has been unusually successful in attracting a faculty of outstanding quality and reputation. The brief biographical faculty data here shown, which do not include their long list of published writings, or their scholastic honors (Phi Beta Kappa, summa cum laude, Rhodes Scholarships, etc.), indicate the unusually high qualifications of the present faculty.

The aggregate practice experience of these members of the faculty has been varied and extensive.

BRAINERD CURRIE, A.B., LL.B., Mercer University; LL.M., J.Sc.D., Columbia University; Instructor in Law, Mercer University, 1935-37; Assistant Professor of Law, Wake Forest College, 1937-41; Associate Professor of Law, University of Georgia, 1941-42; Professor of Law, Duke University, 1946-49; Professor of Law, University of California, Los Angeles, 1949-52; Dean and Professor of Law, University of Pittsburgh, 1952-53; Professor of Law, University of Chicago, 1953-61; Faculty since 1961.



CURRIE

ROBINSON O. EVERETT, A.B., LL.B., Harvard University; U.S.A.F., 1951-1953; Commissioner, U. S. Court of Military Appeals, 1953-1955; General practice, Durham, N. C. and Washington, D. C.; Faculty 1950-1951 and since 1956.



EVERETT

PAUL HARDIN III, A.B., LL.B., Duke University; general practice, 1954; Military Service, United States Army Intelligence, 1954-56; general practice 1956-58; legal studies and researches, University of Edinburgh, summer 1962 (Ford Foundation Grant.) Faculty since 1958.



HARDIN

CLARK C. HAVIGHURST, A.B., Princeton University; J.D., Northwestern University; Military Service, 1958-60; Research Associate, Small Business Studies, Duke University, 1960-61; private practice, 1961-64; Faculty since 1964.



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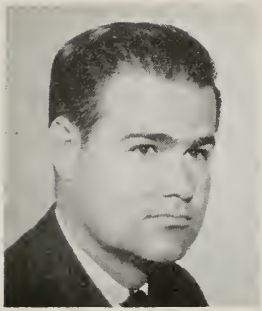


HARDIN

CLARK C. HAVIGHURST, A.B., Princeton University; J.D., Northwestern University; Military Service, 1958-60; Research Associate, Small Business Studies, Duke University, 1960-61; private practice, 1961-64; Faculty since 1964.



HAVIGHURST



JOHNSTON

JOHN D. JOHNSTON, JR., A.B., LL.B., Duke University; with J. P. Morgan Co., New York City, 1956-58. General Practice in Asheville, N. C., 1958-62; Faculty since 1962, and Assistant Dean.



LARSON

ARTHUR LARSON, A.B., LL.D., Augustana College; M.A. (Jurisp.), B.C.L., Oxford University; Fellow of Pembroke College, Oxford; Gen. Prac. 1935-39; Ass't Prof. of Law, Univ. of Tenn., 1939-41; Division Counsel, Office of Price Administration, 1941-44; Chief. Scandinavian Branch, Foreign Economic Administration, 1944-45; Assoc. Prof. and Prof. of Law, Cornell Univ. 1945-53; Fulbright Fellowship, London School of Economics, 1952; Dean, Univ. Pittsburgh Law School, 1933-54; Under Secretary of Labor, 1954-56; Director, U. S. Information Agency, 1956-57; Spec. Ass't to the President of the United States, 1957-58; Faculty and Director World Rule of Law Center since 1958.



LIVENGOOD

CHARLES H. LIVENGOOD, JR., A.B., Duke University; LL.B., Harvard University; general practice 1934-1940; Regional Attorney for the Seventh Region, Wage and Hour Division, U. S. Department of Labor, 1940-1941; Chief of the Wage-Hour Section, Office of the Solicitor of Labor, 1941-1942; general practice, 1945-1948; visiting prof. of law, Univ. of Sydney 1958; Faculty since 1948.



LOWNDES

CHARLES L. B. LOWNDES, A.B., Georgetown University; LL.B., S.J.D., Harvard University; general practice 1926-1927; Assistant Professor of Law, Georgetown University, 1927-1928; Professor of Law, Georgetown University, 1928-1930, 1931-1934; Faculty since 1934.

F. HODGE O'NEAL, A.B., LL.B., Louisiana State University; J.S.D., 1949, Yale University; S.J.D., 1954, Harvard University; Associate Professor of Law, University of Mississippi, 1945-46; Professor of Law, University of Mississippi, 1946-47; Acting Dean and Professor of Law, Walter F. George School of Law, Mercer University, 1948-56; Professor of Law, Vanderbilt University, 1956-59; Visiting Professor of Law, New York University, 1957-58; Faculty since 1959.



O'NEAL

JOEL FRANCIS PASCHAL, A.B., LL.B., M.A., Wake Forest College; Ph.D., Princeton University; Instructor in Law, Wake Forest College, 1939-1940; U.S.N.R., 1942-1946; Instructor, Princeton University, 1946-1947; Research Director, North Carolina Commission for the Improvement of the Administration of Justice, 1947-1949; general practice, 1949-1954; Visiting Professor of Law, Duke University, 1952-1953; Faculty since 1954.



PASCHAL

MELVIN G. SHIMM, A.B., Columbia University; LL.B., Yale University; 2nd Lt., FA (AUS), 1943-1946; general practice, 1950-1951; Counsel, Wage Stabilization Board, 1951-1952; Bigelow Fellow, University of Chicago Law School, 1952-1953; Faculty since 1953.



SHIMM

LAWRENCE G. WALLACE, A.B., M.P.A. (Master of Public Administration), Syracuse University; U. S. Air Force, 1953-55; Staff, Maxwell Graduate School, Syracuse University, 1956; LL.B. 1959, Columbia University; Associate, Covington & Burling, Washington, D. C., 1959-60; Law Clerk to Mr. Justice Black, U. S. Supreme Court, 1960-61; Faculty since 1961.



WALLACE

Some Further Notes On

The Duke Law School

The Duke Law School is a national school and, as national law schools go, a small school. Its ratio of faculty to students is among the highest of the leading law schools and so is its faculty compensation scale. This means that the annual amount which Duke spends per student in giving legal education is, again, among the highest in the nation.

To conduct a school of law with a high calibre faculty of national and international note costs money. Duke law students, however, do not carry the burden of that expense; fortunately a generous endowment, although not autonomous to the law school, carries much of the burden. The student's tuition pays only a fraction of the cost of giving him a legal education.

A law school of Duke's size is particularly well adapted to teach by the "case system" which prevails in this country. This involves teaching by Socratic discussion between student and instructor of actual and hypothetical cases, rather than by lectures which purport to set forth legal precepts in dogmatic fashion. We have managed to keep classes small enough to permit general participation in the student-instructor discussion. However, you must be prepared to find some law classes larger than many classes in the fine small colleges.

There are schools where a student, if he wants to discuss a point with the professor, must make an appointment two weeks in advance. At Duke a student simply appears before his professor's door (usually open) and asks: "Are you busy, Sir?". He may expect a reply: "Yes, I'm busy, but come in and let's see what's troubling you."

Although fully aware that a good lawyer must be a "practical" man who can do things (and not just think about them), legal education at Duke does not over-stress the practical. Beware of claims of practicality. Too often, in education, emphasis on practicality is the earmark of intellectual poverty and cultural barrenness. Law school is no place to learn how to fold legal documents or to learn law office management. A superior law school education is basically a *liberal* education in law. The type of training given at Duke Law

School not only gets the young law graduate off to a fast start in his professional career but also stands him in good stead later on.

The Program of Instruction

It takes three years of study (six semesters) to get the LL.B. degree. Duke maintains no summer school for law. If a Duke law student is determined to shorten the period of three years, he will be permitted, upon consultation with the Dean, to take summer courses at other approved law schools. Thereby he may finish in January of his senior year, instead of the following June. In general, however, the continuous study of law unrelieved by summer vacation is not recommended.

Duke Law School, like others, has had to face this problem in recent years: twenty-five years ago it took three years to complete the law school study; today it still takes three years despite the fact that within the past quarter century the law has grown tremendously in complexity, particularly in fields like Constitutional Law, Labor Law, Administrative Law, Business Regulation, Corporation Finance, International Law; how, then, to fit the law students for law practice in the same period of time? Constant revision in courses, content and method at Duke Law School has not only gone far to solve that problem but has at the same time, while retaining the so-called "case-method" as its basic technique of instruction, improved upon those older teaching methods which have at times led to criticism of law schools by the active Bar.

The Graduate Program

Since this brochure is intended primarily for those who are thinking about the basic legal training in preparation for the bar, description of the program looking to the advanced degrees of Master



A Duke professor's door is olways open to his students. Professor Lowndes, notionolly known tox low expert, cleors o point for o student.

of Laws, Master of Comparative Law and Doctor of Juridical Science is omitted. Information can be obtained by writing to the Dean.

Facilities

In September, 1962 the Law School moved into its new building, which was formally dedicated on April 27, 1963. This new home for the School, just off the Gothic-style core of the Campus, is of more modern design, material and construction, although in keeping with its surroundings. It consists of a classroom wing and a Library and Administration wing, with faculty offices in both wings. The classroom wing also houses the World Rule of Law Center, as well as Small Business Researches. The library is unusually spacious in its reading room in relation to the size of the student body and is similarly spacious for book stacks and interspersed reading tables. The combined seating capacity in the library's main reading room, carrels and inter-stack tables can easily accommodate the entire student body at one sitting. So can the classrooms, not to speak of the numerous seminar, conference and lounge rooms. In addition, the new Court Room can hold almost the entire present student body. Student lockers and vending machines are conveniently located.

Plans are also under consideration for new living accommodations for unmarried law students, to be located next to this new building. These would fittingly supplement the recently built married student housing facilities, which are also situated near the new law building.

Dean Latty explains a point of Business Associations law to the first year class.





A Law Launge offers a place far studying ar a quiet canversation. The new Law Building has a number af launges.

Yes but

Can I Afford the Duke Law School? And Can I Get in?

Don't be dismayed by tall tales that at X Law School they turn down nine for every one who gets in. The truth is, rarely does any law school turn down as many as three out of four applicants, and there are not many law schools that turn down as many as two out of three applicants.

At any law school, your chances of getting in are good if you are above or only a bit below the average or median of the last entering class in either college record or LSAT score. If you are below in both, you can expect difficulty. However, admission is often a complicated process, not just a question of adding up your college record and LSAT score. Geographical representation, college representation, a sense of obligation to the region, an urge to experiment with varying combinations (e.g., a magna cum laude applicant with a LSAT score in the 400's; a 700 LSAT scorer with a "disinterested" college record and a blind spot in French), choice of leader-achiever type as against the back-room researcher, the Admission Officers' guess about next month's ratio of acceptances to offers—all these enter into the picture.

Most students entering Duke Law School were on the Dean's List in college, and most had LSAT scores (morning) above 600. Those rare few who have come in with LSAT scores in the 400's more than made up for it with some outstanding achievement, e.g., Phi Beta Kappa. Although we are still experimenting with the balance between college records and LSAT scores, we are about ready to concede that the applicant with LSAT scores in the 95 percentile who is in the bottom quarter of his class in college is a poor bet.

Increasingly, applicants are taking the test in November of their Senior year in preference to tests later in the year.

We try to limit our entering class to 100. We suggest that applicants get their application in by February 15.

Scholarships and Loans

Financial aid is available, sometimes by scholarship without loan, sometimes by loan without scholarship, often by a combination of the two.

As between applicants of substantially equal caliber, we are forced to give preference in admission to those not seeking scholarship. If a student intends to apply for scholarship, we prefer to receive that application with the application for admission.

Except for a few scholarships based purely on merit, scholarships are for those who combine genuine and serious financial need with records and scores well above the class median. Contrary to the postulates of the classical economists, in the field of scholarships supply *never* equals demand. Realistic scholarship applicants recognize this imbalance and are prepared to yield to the needier applicant.

Sometimes the applicant offered a loan says he doesn't want to start off in life with a debt load. Actually, indebtedness for legal education should be viewed as a sound investment.

Depending on the funds available, loans are either on the generous terms of the National Student Loans (no interest accrues until one year out, then at 3 per cent, repayment thereafter over a 10-year period) or on terms only a bit less generous (1 per cent until graduation, then at 3 per cent, then 6 per cent after 5 years) or on purely commercial terms arranged through a bank.

EXPENSES

The typical basic expenses for a Duke law student for an academic year are:

Tuition	$1200
Rooms (two in room)	250
*Board	550
*Books and Supplies	125
*Laundry	60
	$2185
Travel	?

*Moderate estimate

Naturally, the total figure will vary for the individual student, particularly the travel item.

Job Opportunities While in School

It is not advisable for a law student to attempt any substantial amount of outside work. Nevertheless, a student who is highly efficient in the use of his time can, by saving minutes that others waste, devote some of them to supplementing his other financial resources. A number of positions in the Law Library are filled by law students. Outstanding students (second and third year) are often employed to assist faculty members. The University maintains an office to aid students in finding employment, and many of the available jobs go to law students, since as a group they have proven their reliability over the years.

If you are married and your wife can teach school or do secretarial or nursing work, the opportunities for employment in the region in which the School is located are very good. Other employment opportunities are of course available. Of recent years, between one third and one half of the Duke law students have been married. Many of them have been able to pursue their law studies by virtue of the fact that their wives, if unburdened by small children, can hold jobs.

Some General Information

World Rule of Law Center

A few years ago the Duke Law School established its World Rule of Law Center, with Professor Arthur Larson as its Director.

The purpose of this Center is to advance the objective of getting legal rules and procedures accepted and used in the settlement of international disputes, including disputes of a kind that threaten



The World Rule of Law Center staff in June, 1963: Mr. Halderman, Mr. Partan, Dr. Grzybawski, Dr. Larsan, Dr. McClure, Mr. Nawaz, Mr. Crane, Mr. Liacouras

world peace. It aims to do this by maintaining a nucleus and clearing house for ideas, activities, and research that will advance this aim.

The Center has produced significant researches and publications. The establishment of the Center has broadened the range of international studies and researches available to Duke law students having particular interest in this area.

Publications

Law and Contemporary Problems

For over a quarter-century the Duke Law School has published four times a year *Law and Contemporary Problems,* a unique legal periodical which was originated with the underlying philosophy that to understand intelligently the role that law plays in any transaction or institution, one must also know the non-legal factors involved. These factors may be business matters or sociological, political or administrative matters. Accordingly, each issue is devoted to a symposium consisting of a number of articles, each of which is written by an expert in that particular field, legal or non-legal. Here are illustrative titles of recent symposia: Securities Regulation, Government Contracts, Jurimetrics, Academic Freedom, and The Soviet Impact On International Law. Here again the Duke Law School has pioneered. Despite imitators, *Law and Contemporary Problems* remains a unique and outstanding institution among the world's legal publications. Many issues have been used as texts in college and graduate school courses.

The Duke Law Journal

It has been the constant aim of the Law School to develop the capacity in its students to do superior legal writing, which is an indispensable requisite for a good lawyer. Not only is this objective emphasized in the program of instruction itself, but the students are also provided with a vehicle for the publication of their efforts. Appearing quarterly the *Duke Law Journal* contains student commentaries on currently significant legal problems. Election to Editorial Board membership is based solely on merit.

The Journal of Legal Education; the *Corporate Practice Commentator*

Both of these well-known legal periodicals have their editorial offices at Duke Law School, under the editorship of Professor John D. Johnston and Professor F. Hodge O'Neal, respectively.

The Duke Bar Association

Professional, social, and other extra-curricula activities of the law school are conducted by the students themselves through the medium of the Duke Bar Association. This organization, which includes all the students in the Law School, is similar in composition and purpose both to a university student government and to a professional

bar association of the kind to which you will belong as a practicing lawyer. It is also the center of the Law School's non-academic life.

The Association through its various committees carries on a wide variety of functions, including publishing the seniors' *Placement Bulletin,* assisting in moot court competitions, publicizing the activities of the Law School and of the individual students, procuring speakers of interest from the outside and providing well rounded athletic and social programs. The Association also administers the Law School Honor Code through an elected Judicial Board.

The Duke International Law Society

The internationally-minded law student can find at Duke Law School considerable to challenge him: formal courses in legal aspects of international affairs, the World Rule of Law Center, the World Law section of the Duke Law Journal and the Duke International Law Society. The latter, a charter member (with the law schools of Columbia, Harvard, Virginia and Yale) of the Association of Student International Law Societies, has a program of researches, of participation in international moot court competitions and in conferences relating to international law, of engaging speakers in that field, and related activities. A substantial percentage of the Duke law students belong to the Society.

Law Living Quarters

Although some law students desire to live off campus, the great majority of the non-married students live in the Men's Graduate Living Center. Here they reside with students from the School of Medi-



The Woman's College (1200 undergraduates) with its own nearby campus and distinctive architecture is autonomous, yet an integral part of Duke University.

cine, the Graduate School of Arts and Sciences, the Divinity School, and the School of Forestry.

This Center, in addition to providing comfortable living quarters for 400 graduate and professional students, has its own dining rooms, lounges, recreational halls and study rooms. A cosmopolitan atmosphere prevails, invigorating and beneficial to a young man preparing for a career in any field. This environment should be particularly valuable to future lawyers, who must acquire a broad outlook and an analytical perspective of other professions if they are to succeed in their own.

Housing for married students was completed in 1963. Rentals are $70-90 a month including heat, light, water. These units are in great demand. (First come, first served.) In addition, adequate facilities for married students are available off campus at similarly reasonable prices.



At left the main lounge and at right the coffee shop of the Men's Graduate Living Center.

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(Supplement To The Bulletin Of Duke University)

Law study and law training are stepping stones to many careers. A glance at any Duke Law School graduating class will illustrate the point. In recent years, for example, graduates have gone into government service (federal and state), judicial clerkships, business enterprises, graduate work, and teaching at the college and university level. The majority of graduates choose private practice with established firms, however. The following is a representative list (not complete) of the firms with which members of the last three graduating classes have become associated:

Akerman, Senterfitt, Eidson & Mesmer
Orlando, Florida

Alley, Maass, Rogers & Lindsay
Palm Beach, Florida

Anderson, Rush, Dean & Lowndes
Orlando, Florida

Anderson, Walker & Reichert
Macon, Georgia

Arter, Hadden, Wykoff & Van Duzer
Cleveland, Ohio

Baker, Hostetler & Patterson
Cleveland, Ohio

Battle, Neal, Harris, Minor & Williams
Richmond, Virginia

Biehn & Thatcher
Quakertown, Pennsylvania

Black, Cobb, Cole & Crotty
Daytona Beach, Florida

Boyd, Walker & Concannon
Keokuk, Iowa

Bradley, Arant, Rose & White
Birmingham, Alabama

Brumbaugh, Free, Graves & Donohue
New York City

Burlingham, Underwood, Barron, Wright & White
New York City

Buschmann, Carr, Schabel & Tabbert
Indianapolis, Indiana

Cadwalader, Wickersham & Taft
New York City

Coker & Carlon
Fort Lauderdale, Florida

Coleman, Gantt & Ramsay
Pine Bluff, Arkansas

Cowart & Ritchie
Cocoa, Florida

Cravath, Swaine & Moore
New York City

Cushman, Darby & Cushman
Washington, D. C.

Davis, Polk, Wardell, Sunderland & Kiendle
New York City

Doherty, Rumble & Butler
St. Paul, Minnesota

Donovan, Leisure, Newton & Irvine
New York City

Erickson, Popham, Haik & Schnobrich
Minneapolis, Minnesota

Fleming, Robinson & Bradshaw
Charlotte, North Carolina

Foley, Sammond & Lardney
Milwaukee, Wisconsin

Gibson, Dunn & Crutcher
Los Angeles, California

Giles, Hedrick & Robinson
Orlando, Florida

Grossman, Schlesinger & Carter
Cleveland, Ohio

Hamel, Morgan, Park & Saunders
Washington, D. C.

Hand, Arendall, Bedsole, Greaves & Johnston
Mobile, Alabama

Hansell, Post, Brandon & Dorsey
Atlanta, Georgia

Haynsworth, Perry, Bryant, Marion & Johnston
Greenville, South Carolina

Helsell, Paul, Fetterman, Todd & Hokanson
Seattle, Washington

Hicks, Kuhlthau & Nagle
New Brunswick, New Jersey

Hinckley, Allen, Salisbury & Parsons
Providence, Rhode Island

Howard & Lewis
Provo, Utah

Hudson, Ferrell, Petree, Stockton, Stockton & Robinson
Winston-Salem, North Carolina

Jones, Bird & Howell
Atlanta, Georgia

Kennedy, Covington, Lobdell & Hickman
Charlotte, North Carolina

Lassiter, Moore & Van Allen
Charlotte, North Carolina

Latham & Watkins
Los Angeles, California

McNees, Wallace & Nurick
Harrisburg, Pennsylvania

Mahoney, Hadlow, Chambers & Adams
Jacksonville, Florida

McDougle, Ervin, Horack & Snepp
Charlotte, North Carolina

Miller & Chevalier
Washington, D. C.

Morrison, Hecker, Cozad & Morrison
Kansas City, Missouri

Nichols, Gaither, Beckham, Colson & Spence
Miami, Florida

Nixon, Mudge, Rose, Guthrie & Alexander
New York City

Olwine, Connelly, Chase, O'Donnel & Weyher
New York City

O'Mara, Schumann, Davis & Lynch
Jersey City, New Jersey

O'Melveny & Myers
Los Angeles, California

Parkinson, Sessions, Duffet & Barry
Daytona Beach, Florida

Patterson, Freeman, Richardson & Watson
Jacksonville, Florida

Phillips, Mahoney, Lytle, Yorkey & Letchworth
Buffalo, New York

Powell, Goldstein, Frazer & Murphy
Atlanta, Georgia

Poyner, Geraghty, Harsfield & Townsend
Raleigh, North Carolina

Rives, Peterson, Pettus & Conway
Birmingham, Alabama

Rogers, Towers, Bailey, Jones & Gay
Jacksonville, Florida

Ross, McCord, Ice & Miller
Indianapolis, Indiana

Rush, Reed & Marshall
Orlando, Florida

Shackleford, Farrior, Stallings, Glas & Evans
Tampa, Florida

Sidley, Austin, Burgess & Smith
Chicago, Illinois

Simpson Thacher and Barlett
New York City

Skeel, McKelvy, Henke, Evenson & Uhlmann
Seattle, Washington

Smith, Swift, Currie, McGhee & Hancock
Atlanta, Georgia

Spears, Moore, Reeman & Williams
Chattanooga, Tennessee

Spears & Spears
Durham, North Carolina

Squire, Sanders & Dempsey
Cleveland, Ohio

Stoll, Keenan & Park
Lexington, Kentucky

Strang, Fletcher, Carriger & Walker
Chattanooga, Tennessee

Swann & Swann
Orlando, Florida

Taft, Stettinius & Hollister
Cincinnati, Ohio

Thigpen & Hines
Charlotte, North Carolina

Weaver & Glassie
Washington, D. C.

Willcox, Cooke, Savage & Lawrence
Norfolk, Virginia

Wilson, Branch, Barwick & Vandiver
Atlanta, Georgia

"Summer Internship" Program

Many law firms throughout the country participate in the so-called "summer internship" program for second-year students. This program enables the student to get an actual taste of law practice as seen by the young associate in a modern, busy law office. Many students find the summer program helpful in deciding whether or not to practice law, where they would like to live, what type of practice they enjoy most, etc. Law firms look upon the program as a means of spotting talented young men for permanent association with the firm.

Many of the firms previously listed in this folder participate in the summer program. In addition, during the last two years our second-year students, including a class still in school, have interned with the following firms (list incomplete):

Alston, Miller & Gaines
Atlanta, Georgia

Armbrecht, Jackson, McConnell & DeMouy
Mobile, Alabama

Baker & Daniels
Indianapolis, Indiana

Ballard, Spahr, Andrews & Ingersoll
Philadelphia, Pennsylvania

Barnwell, Whaley, Stevenson & Patterson
Charleston, South Carolina

Botts, Mahoney, Whitehead, Ramsaur & Hadlow
Jacksonville, Florida

Breeden, Howard & MacMillan
Norfolk, Virginia

Buffinton, Crowther, Bogle & Westgate
Fall River, Massachusetts

Bunker, Elliott & Mooney
Plainfield, New Jersey

Cabot, Scott & Wenkstern
Fort Lauderdale, Florida

Coffin, Grifo & De Raymond
Easton, Pennsylvania

Coke & Coke
Dallas, Texas

Cross, Shriver, Bright & Washburne
Baltimore, Maryland

Denny, Valentine & Davenport
Richmond, Virginia

Dunbar, Kienzle & Murphy
Columbus, Ohio

De Lange, Hudspeth, Pitman & Katz
Houston, Texas

Durey & Pierson
Stamford, Connecticut

Eaton, Bell, Hunt & Seltzer
Charlotte, North Carolina

Effron & Goldberg
Poughkeepsie, New York

Ely, Guess, Rudd & Havelock
Anchorage, Alaska

Everett, Everett & Everett
Durham, North Carolina

Grier, Parker, Poe & Thompson
Charlotte, North Carolina

Holland & Hart
Denver, Colorado

Jennings, Strouss, Salmon & Trask
Phoenix, Arizona

Lange, Simpson, Robinson & Somerville
Birmingham, Alabama

LaRogue, Allen & Cheek
Kinston, North Carolina

Mayer, Friedlich, Spiess, Tierney, Brown & Platt
Chicago, Illinois

McCume, Hiaasen, Crum & Furis
Fort Lauderdale, Florida

Miller, Martin, Hitching, Tipton & Lenihan
Chattanooga, Tennessee

Mirick, O'Connell, DeMallie & Lougee
Worcester, Massachusetts

Morris, James, Hitchens & Williams
Wilmington, Delaware

Newsom, Graham, Strayhorn & Hedrick
Durham, North Carolina

Patterson, Belknap & Webb
New York City

Peters & Prather
Meadville, Pennsylvania

Piper & Marbury
Baltimore, Maryland

Reed, Smith, Shaw & McClay
Pittsburgh, Pennsylvania

Saul, Ewing, Remick & Saul
Philadelphia, Pennsylvania

Sayles, Evans, Brayton, Palmer & Tifft
Elmira, New York

Seyfarth, Shaw, Fairweather & Geraldson
Chicago, Illinois

Sharp & Bogan
Washington, D. C.

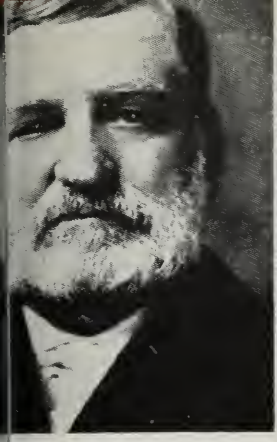
Shumaker, Loop & Kendrick
Toledo, Ohio

Sutherland, Asbill & Brennan
Atlanta, Georgia

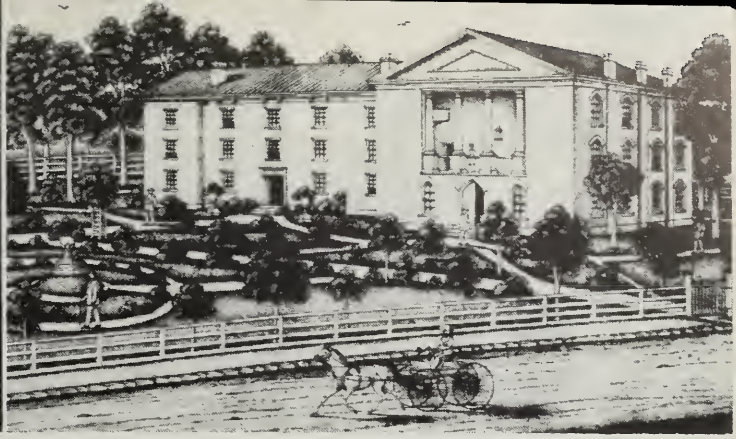
Willkie, Farr, Gallagher, Walton & Fitzgibbon
New Work City

Wiser, Shaw, Freeman, Ickes & Williams
Rochester, New York

Younge, Frederick & Rutherford
Peoria, Illinois



Mordecai (1904-1927)



Trinity College in Randolph County about 1860

History of the Law School

Duke University is built around Trinity College, which goes back in its origin to the year 1838-1839, when Union Institute was founded. The teaching of law as part of a cultural education constituted the beginning of legal instruction in this institution in 1850. Professional education for law began in 1868 when the Department of Law of Trinity College was established.

The modern School of Law was founded in 1904 upon an endowment established by James B. and Benjamin N. Duke. Dr. Samuel Fox Mordecai, distinguished lawyer, scholar and teacher, organized the School and was its Dean until his death in 1927. The establishment of this School set a new standard in southern legal education, it being the first law school in the area to require the completion of two years of college work as an entrance requirement. The case method was used as the basis of instruction; and in this respect also the School was a pioneer in law-school method in this area. The completion of three years resident study was required for the LL.B. degree.

As a result of the foundation of Duke University in 1924, the School of Law has shared in the expansion incident thereto. In 1930, with the removal of the Law School to the newly completed Law Building, and the appointment of a greatly increased faculty and staff, the Law School entered upon a new stage. It was reorganized and the curriculum and professional activities much broadened, with the purpose of creating in this southeastern area a progressive law school of national scope and character.

Throughout its history the School has emphasized quality rather than quantity of student body.

Since the reorganization of the School in 1930, the following persons have served as Deans or Acting Deans: Justin Miller, 1930-1934; H. Claude Horack, 1934-1947; Harold Shepherd, 1947-1949; Charles L. B. Lowndes, 1949-1950; Joseph A. McClain, Jr., 1950-1956; Dale F. Stansbury, 1956-1957; Elvin R. Latty, since 1957.

Further Information may
be obtained from:

The Dean
School of Law
Duke University
Durham, N. C.

BULLETIN
OF
DUKE UNIVERSITY



The Summer Session 1965

First Term: June 12 to July 17
Second Term: July 19 to August 24

VOLUME 37 February, 1965 NUMBER 3

Annual Bulletins

For Bulletin of Information for Prospective Students, apply to *The Registrar,* Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to *The Registrar,* Duke University, Durham, N. C.

For Bulletin of The College of Engineering, apply to *The Registrar,* Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to *The Dean of the Divinity School,* Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to *The Dean of the School of Forestry,* Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to *The Dean of the Graduate School,* Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to *The Dean of the School of Law,* Duke University, Durham, N. C.

For Bulletin of The School of Medicine, apply to *The Dean of the School of Medicine,* Duke University, Durham, N. C.

For Bulletin of The School of Nursing, apply to *The Dean of the School of Nursing,* Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to *The Director of the Summer Session,* Duke University, Durham, N. C.

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Name and Address of Managing Editor: Miss Carolyn Golding, Assistant to the Registrar, Duke University, Durham, North Carolina.

Owner: Duke University, Durham, North Carolina.

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(Act of October, 1962: Section 4369. Title 39 U.S. Code)

BULLETIN

OF

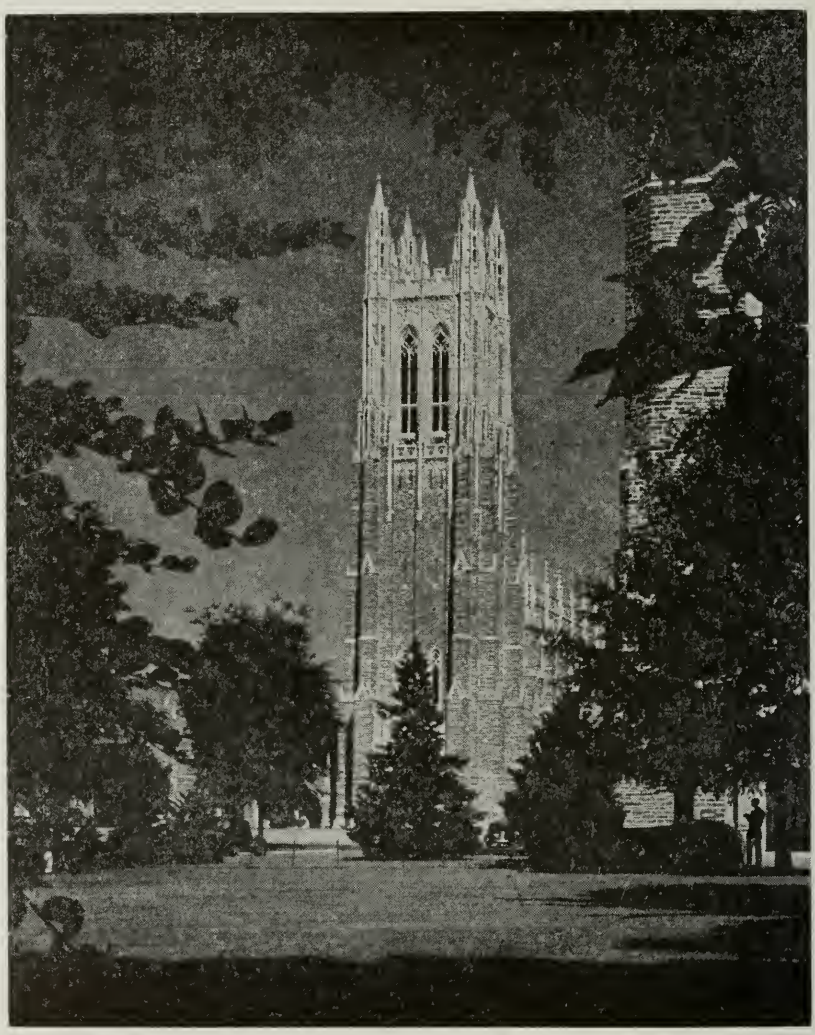
DUKE UNIVERSITY

The Summer Session 1965

ANNOUNCEMENTS

First Term: June 12 to July 17
Second Term: July 19 to August 24

DURHAM, NORTH CAROLINA
1965



The Chapel Tower

The Chapel Tower dominates the scene of West, or the University, Campus, and it symbolizes the spiritual heritage of the University. The predominantly Gothic architecture, traditionally restless and aspiring, contributes to the intellectually stimulating atmosphere of the University and provides an appropriate setting for educational endeavors.

Calendar of the Summer Session 1965

JUNE						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

June 11, Friday, 12 o'clock noon
Dormitories ready for occupancy

June 12, Saturday
Registration for First Term

June 12-July 17, Saturday-Saturday
Summer Institute in English

June 14, Monday
Instruction begins in all courses of the First Term except 4 s.h. science courses

June 13-19, Sunday-Saturday
Basketball Clinic

June 14-25, Monday-Friday
Junior Engineers and Scientists Summer Institute

June 16, Wednesday, 3:00 p.m., Social Science Building, Room 139
Meeting regarding requirements and regulations for various degree programs of *students majoring in Education.*

June 17-18, Thursday-Friday
Elementary Education Conference—Art

June 17-July 2, Thursday-Friday
Conference on Modern Mathematics for Elementary Teachers

June, 20-26, Sunday-Saturday
Basketball Clinic

June 21, Monday
Instruction begins in 4 s.h. courses of First Term in Chemistry, Geology and Physics

June 22-August 24, Monday-Friday
National Science Foundation Institute Program

June 22-23, Tuesday-Wednesday
School Law Conference

June 24, Thursday
Final date for filing with the Dean of the Graduate School statement of intention to complete Master's degree requirements during the First Term, and for filing title of Master's thesis.

July 3, Saturday
No classes

July 5, Monday
French and Spanish examinations for candidates for graduate degrees, 4:00 p.m. Room 233, Allen Building. Candidates register in the Graduate School Office no later than June 25.

July 5-9, Monday-Friday
German examinations for candidates for graduate degrees. Candidates register in the Graduate School Office no later than June 25.

July 5-31, Monday-Saturday
Medical Mycology Course

July 7-9, Wednesday-Friday
Piano Workshop

July 8, Thursday
Major examination for candidates for the M.Ed. degree without thesis

July 12-August 6, Saturday-Tuesday
The Methodist Course of Study School

July 15, Thursday
The initial Session of the 1965-66 Retired Armed Services Officers Training Program.

July 16-17, Friday-Saturday
Final examination for First Term

July 19, Monday
Registration for all Second Term courses, including science courses

July 20, Tuesday
Instruction begins in all Second Term courses including science courses

July 19-30, Monday-Friday
Clinic in Preaching

July 19-30, Monday-Friday
Clinic in Pastoral Care

July 19-30, Monday-Friday
Rural Church Clinic

July 23, Friday
Final date for filing with the Dean of the Graduate School statement of intention to complete Master's degree requirements during the Second Term, and for filing title of Master's thesis.

July 26-30, Saturday-Wednesday
Conference of the Youth Council of the Methodist Youth Fellowship

July 31, Saturday
No classes

August 7, Saturday
Educational Testing Service examinations in French, German and Russian. Engineering Building, Room 125, 9:00 a.m.

August 14, Saturday
No classes

August 15-21, Monday-Saturday
Basketball Clinic

August 16, Monday
Last day for submitting thesis for Master's degree

August 17, Tuesday
Major examination for candidates for the M.Ed. degree without thesis

August 17, Tuesday
Final examination in all 4 s.h. courses of the Second Term in Chemistry, Geology and Physics

August 23-24, Monday-Tuesday
Final examinations in all courses of the Second Term, except science courses ending on August 17.

Table of Contents

Administration Officers 6

The Summer Session Faculty 8

Function of the Summer Session 11

Admission 12

Financial Information, Living Accommodations, and Medical Care 14

Registration 20

Academic Regulations 23

University Services, Publications, and Student Activities 27

Resources of the University 28

Special Conferences and Courses 29

Graduate Study in Summer Session 33

Undergraduate Study 42

School of Nursing 42

Divinity School Studies 42

Courses of Instruction 43

Administrative Officers of the Summer Session

Douglas Maitland Knight, Ph.D., Litt.D., LL.D.
President of the University

Robert Taylor Cole, Ph.D.
Provost

Gerhard Chester Henricksen, M.A., C.P.A.
Vice President for Business and Finance Treasurer

Everett Harold Hopkins, LL.D.
Vice President for Planning and Institutional Studies and Assistant Provost

Frank Leon Ashmore, A.B.
Vice President for Institutional Advancement

Charles Edward Jordan, A.B., LL.D.
Vice President for University Relations

Frank Traver de Vyver, Ph.D.
Vice Provost

Harold Walter Lewis, Ph.D.
Dean of Arts and Sciences and Vice Provost

Barnes Woodhall, M.D.
Vice Provost

William George Anlyan, M.D.
Dean of the School of Medicine

Benjamin Edward Powell, Ph.D.
Librarian

Richard Lovejoy Tuthill, Ed.D.
University Registrar

John Marion Dozier, A.B.
Business Manager

Stephen Cannada Harward, C.P.A.
Comptroller and Internal Auditor

Olan Lee Petty, Ph.D.
Director of the Summer Session

Richard Lionel Predmore, D.M.L.
Dean of the Graduate School of Arts and Sciences

Craufurd David Goodwin, Ph.D.
Secretary

Edwin Constant Bryson, LL.B.
University Counsel

———

Mary Margaret Ball, Ph.D.
Dean of the Woman's College

Cazlyn Green Bookhout, Ph.D.
Director of the Duke Marine Laboratory

William Lambreth Brinkley, Jr., M.P.S.
Director of Undergraduate Admissions

Robert Earl Cushman, Ph.D.
Dean of the Divinity School

Ellwood Scott Harrar, Ph.D.
Dean of the School of Forestry

Ann Madeline Jacobansky, M.S.N.
Dean of the School of Nursing

James Lathrop Meriam, Ph.D.
Dean of the College of Engineering

James Ligon Price, Jr., Ph.D.
Dean of Trinity College

Francis Ezra Bowman, Ph.D.
Associate Dean and Director of Admissions
Graduate School of Arts and Sciences

Robert Boyd Cox, A.M.
Dean of Undergraduate Men and
Associate Dean of Trinity College

Charles Buchanan Johnson, Ed.D.
Associate Dean of Trinity College

Jane Philpott, Ph.D.
Associate Dean of Undergraduate Instruction
The Woman's College

Dana Phelps Ripley, Ph.D.
Assistant Dean of Trinity College

Howard Austin Strobel, Ph.D.
Associate Dean of Trinity College

Mary Grace Wilson, A.M.
Dean of Undergraduate Women

C. Hilburn Womble, Ph.D.
Assistant Dean of Trinity College and Dean of Freshmen

———

Carol Lynn Garris, M.Ed.
Residence Director and House Counselor for Graduate Women, Term I

Ella Eugenia Shore, M.A.
House Counselor for Undergraduate Women, Term I

Mildred D. Durden, M.Ed.
Residence Director and House Counselor for Graduate Women, Term II

Eva B. Poythress, M.A.
House Counselor for Undergraduate Women, Term II

W. S. Persons, A.B.
Recreation Supervisor for the Summer Session

———

James T. Cleland, D.D.
Dean of the Chapel

Howard Charles Wilkinson, D.D.
Chaplain to the University and Director of Religious Activities

Paul Young, M.A.
Director of Choral Music

The Summer Session Faculty

Alt, A. Tilo, M.A.
Instructor in German

Anderson, Carl L., Ph.D.
Associate Professor of English

Baker, Frank, Ph.D.
Associate Professor of English Church History

Barnes, Robert, Ph.D.
Visiting Professor of Zoology

Binkley, Robert W., Ph.D.
Assistant Professor of Philosophy

Bolmeier, E. C., Ph.D.
Professor of Education

Bonk, James, Ph.D.
Assistant Professor of Chemistry

Brown, Frances C., Ph.D.
Professor of Chemistry

Bryant, Joseph A., Ph.D.
Visiting Professor of English
Woman's College, University of North Carolina
Greensboro

Bryson, Marion, Ph.D.
Assistant Professor of Mathematics

Carpenter, David W., Ph.D.
Professor of Physics

Carson, Robert C., Ph.D.
Associate Professor of Psychology

Cell, John W., A.B.
Instructor in History

Chaiken, Leon E., M.F.
Professor of Forest Management

Chambers, Robert L., B.S. in Education
Assistant Professor of Physical Education

Cherpack, Clifton, Ph.D.
Professor of Romance Languages

Colver, Robert M., Ed.D.
Associate Professor of Education

Davis, Richard B., Ph.D.
Visiting Professor
University of Tennessee

Duffey, Bernard I., Ph.D.
Professor of English

Ferguson, Arthur B., Ph.D.
Professor of History

Ferguson, Oliver W., Ph.D.
Associate Professor of English

Flint, Weston, Ph.D.
Assistant Professor of Romance Languages

Gehman, Mrs. Ila, Ed.D.
Associate Professor of Medical Psychology

Gehman, W. Scott, Jr., Ph.D.
Associate Professor of Psychology in Education

Gillin, Donald, Ph.D.
Assistant Professor of History

Ginter, Donald E., Ph.D.
Instructor in History

Githens, Sherwood, Jr., Ph.D.
Professor of Education

Goode, William, M.A.
Instructor of Romance Languages

Goodling, Richard A., Ph.D.
Associate Professor of Pastoral Care

Gray, Irving E., Ph.D.
Professor of Zoology

Greenwald, Herbert, Ph.D.
Visiting Professor
University of North Carolina
Chapel Hill

Harrison, Francis P., Ph.D.
Associate Professor of Physical Education

Heron, Stephen D., Jr., Ph.D.
Associate Professor of Geology

Herzog, Frederick, L., Th.D.
Associate Professor of Systematic Theology

Hill, Douglas G., Ph.D.
Professor of Chemistry

Hopkins, John I., Ph.D.
Visiting Professor
Davidson College

Hull, Alexander, Ph.D.
Assistant Professor of Romance Languages

Humm, Harold J., Ph.D.
Associate Professor of Botany

Hurlburt, Allan S., Ph.D.
Professor of Education

Huse, Mrs. Mary, Ph.D.
Assistant Professor of Medical Psychology

Joerg, Frederick C., M.B.A.
Professor of Economics

Johnson, Terry W., Jr., Ph.D.
Associate Professor of Botany

Jones, Leon L., Ph.D.
Assistant Professor of Chemistry

Keane, William, M.B.A.
Assistant Professor of Economics

Langford, Thomas A., Ph.D.
Assistant Professor of Religion

Lerner, Warren, Ph.D.
Assistant Professor of History

McCollough, Thomas E., Th.D.
Assistant Professor of Religion

McGalliard, John C., Ph.D.
Visiting Professor
University of Iowa

Martin, David V., Ed.D.
Assistant Professor of Education

Mathews, Donald G., Ph.D.
Visiting Professor
Princeton University

Meyer, Robert B., Ph.D.
Visiting Professor
Monmouth College

Miller, Robert M., Ph.D.
Visiting Professor
University of North Carolina
Chapel Hill

Najam, Edward, Ph.D.
Visiting Professor
Indiana University

Naylor, Thomas H., Ph.D.
Assistant Professor of Economics

Osborne, James G., B.S.
Professor of Forest Biometry

Partin, Harry B., Ph.D.
Assistant Professor of Religion

Petty, Olan L., Ph.D.
Associate Professor of Education

Pfaff, Eugene E., Ph.D.
Visiting Professor
University of North Carolina
Greensboro

Phillips, James H., Ph.D.
Associate Professor of Religion

Pittillo, Robert, Ed.D.
Assistant Superintendent
Raleigh City Schools

Poteat, William, Ph.D.
Associate Professor of Christianity and Culture

Reynolds, Thomas, Ph.D.
Associate Professor of Mathematics

Richey, McMurry S., Ph.D.
Associate Professor of Theology and Christian Nurture

Roberts, John, Ph.D.
Visiting Professor
University of Massachusetts

Roy, Ronald F., Ph.D.
Associate Professor of Sociology

Rudisill, Mabel F., Ph.D.
Associate Professor of Education

Salinger, Herman, Ph.D.
Professor of German

Sandefur, Earl, M.Ed.
Visiting Lecturer

Settle, James N., Ph.D.
Assistant Professor Classical Studies

Seymour, Richard K., Ph.D.
Associate Professor of German

Shuman, R. Baird, Ph.D.
Associate Professor of Education

Sieber, Harry, B.A.
Instructor in Romance Languages

Silva, Paul C., Ph.D.
Visiting Professor
University of California

Simpson, William H., Ph.D.
Associate Professor of Political Science

Smith, David A., Ph.D.
Assistant Professor of Mathematics

Smith, Donald S., II, M.H.A.
Assistant Professor of Hospital Administration

Smith, Harmon L., Ph.D.
Assistant Professor of Christian Ethics

Smith, Robert S., Ph.D.
Professor of Economics

Spector, Marshall, Ph.D.
Assistant Professor of Philosophy

Stanley, D. Keith, Jr., Ph.D.
Assistant Professor of Greek

Stedman, Donald J., Ph.D.
Assistant Professor of Medical Psychology in the Department of Psychiatry

Stefansson, Unnsteinn, Ph.D.
Adjunct Professor of Duke University

Stevenson, Lionel, Ph.D.
James B. Duke Professor of English

Stumpf, W. A., Ph.D.
Professor of Education

Sublett, Henry L., Jr., Ed.D.
Associate Professor of Education

ter Horst, Robert, Ph.D.
Assistant Professor of Romance Languages

Terry, Robert, B.A.
Instructor in Romance Languages

Thompson, Edgar T., Ph.D.
Professor of Sociology

Torre, Elias, Doctor en Filosofia y Letras (Madrid)
Associate Professor of Romance Languages

Wall, Robert E., Jr., M.A.
Instructor in History

Wallace, William H., Ph.D.
Assistant Professor of Economics

Ward, Charles E., Ph.D.
Professor of English

White, Fred M., M.F.
Assistant Professor of Forestry

Whitridge, Mrs. Eugenia R., Ph.D.
Assistant Professor of Sociology

Wilbur, Robert L., Ph.D.
Associate Professor of Botany

Williams, George W., Ph.D.
Associate Professor of English

Williamson, Rene, Ph.D.
Visiting Professor
Louisiana State University

Willson, Amos L., Ph.D.
Associate Professor of German

Wintermute, Orval S., Ph.D.
Assistant Professor of Religion

Wooley, Allan D., Ph.D.
Instructor in Classical Studies

Young, Charles R., Ph.D.
Associate Professor of History

To Former Students and Prospective Students of the Summer Session

The Summer Session at Duke University makes available to Duke students, to students from other universities and colleges, to teachers in elementary and secondary schools, and to other special students a notable program of instruction in many fields of knowledge, both academic and professional.

Course programs offered during the summer are designed to meet special and particular needs as well as the more conventional requirements leading to specific degrees.

Undergraduates of Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending two or more Summer Sessions.

Graduates of accredited high schools, both men and women, who have been admitted to the freshmen class of Duke University may begin their work in the Summer Session.

Undergraduates from other colleges and universities may enjoy the special advantages of summer instruction at Duke and transfer earned credits to their own institutions.

Graduate students who have been admitted to the Graduate School to study for the Master of Arts, Master of Education, and Master of Arts in Teaching degrees will find courses arranged in sequence from summer to summer to meet their requirements.

Teachers from elementary and secondary schools who desire to earn credits toward the renewal of their certificates and who are interested in further teacher training in subject content and method may enroll in senior-graduate courses as special or unclassified students.

While the summer course program meets in many departments the needs of degree candidates, it goes beyond these limits in presenting also courses of wide general interest and, in addition, special non-credit lectures, conferences, institutes, and workshops.

Duke University's ample and modern research facilities will be available during the summer to all properly qualified students. It is the hope of the University, of the summer faculty, and of the administrative officers that former students and new students will find increasing values in each summer spent at Duke.

THE DIRECTOR

Admission

Students in the following categories may be admitted to the Duke University Summer Session:

1. Graduates and undergraduates who are presently enrolled and in good standing in Duke University.
2. Graduates and undergraduates who have been formally admitted, or re-admitted, to Duke University.
3. Students who are currently in good standing at their respective institution and who have approval by the proper authority to take and transfer credits earned in the Duke Summer Session.
4. Teachers in service with or without the Bachelor's degree who wish to earn credits for certification purposes.

Admission to specific courses offered in the Summer Session is governed by the student's academic status (freshman, sophomore, junior, senior, graduate, special or unclassified) and by the prerequisites of the course in question.

Students in Residence at Duke University during the Spring Semester 1965

A Duke University student, either graduate or undergraduate, who plans to attend the Summer Session should at the time of pre-registration for the fall semester (see p. 21 for specific dates) enroll for the desired Summer Session courses. He need *not* file with the Summer Session the application blank at the end of this *Bulletin*.

Students Not in Residence at Duke University during the Spring Semester 1965

UNDERGRADUATES. New students seeking to enter Duke University as freshmen or as undergraduates with advanced standing, and undergraduates who wish to re-enter the University should write the Office of Admissions requesting application forms.

Undergraduates, both men and women, enrolled in other colleges and universities who desire to earn in the Duke University Summer Session credits which are to be transferred to their own institutions should apply directly to the Director of the Summer Session, Duke

University, on the application form at the end of this *Bulletin*. They should give accurately and clearly all information called for on the application form.

GRADUATES. Students with graduate standing and teachers in service with or without the Bachelor's degree who wish to earn credits toward the renewal or the advancement of their certificate and who do not wish to become candidates for a degree at Duke University should apply to the Director of the Summer Session on the application form at the end of this *Bulletin*.

Graduate students who are seeking admission to the Graduate School of Arts and Sciences and those who have been admitted to the Graduate School must apply to the Director of the Summer Session on the application form at the end of this *Bulletin*. Those who are seeking admission to the Graduate School *must also file* Graduate School application forms which may be secured by writing to the Dean of the Graduate School, Duke University, Durham, North Carolina.

Admission to Degree Candidacy

Credits earned during the Summer Session may be applied toward the requirements of a degree.

UNDERGRADUATES. A student seeking to enroll as a candidate for the Bachelor's degree from one of the colleges of Duke University must meet the entrance requirements set forth in the *Bulletin of Undergraduate Instruction* and be accepted by the Director of Admissions. This *Bulletin* may be secured by writing the Office of Admissions, Duke University.

GRADUATES. A student seeking to enroll as a candidate for one of the advanced degrees offered by the Graduate School of Arts and Sciences of Duke University must meet the requirements set forth on pages 33-41 of this *Summer Session Bulletin*.

Financial Information, Living Accommodations, and Medical Care

Fees

The University Fee:
Covering registration, tuition, and medical care.....$35.00 per semester hour
($35.00 per unit in Graduate School)
Teachers in full-time service in Elementary and Secondary schools.....$15.00 per semester hour
Divinity School students approved by the Dean of that school.....$17.50 per semester hour

Laboratory Fees: (These where applicable are in addition to the University Fee.)
Marine Laboratory.....$10.00 per course
(For Marine Laboratory investigators' research table fees see Marine Laboratory Bulletin.)

Fees Replacing University Fee:
Medical Mycology.....$100.00

Master's Degree Summer Session Fee:
A candidate for the Master's degree who completes in the Summer Session 15 or more semester hours required for the degree and who finishes the work in the Summer Session pays a degree fee of.....$ 25.00
A Master's degree candidate who is not required to pay the fee under Item 1 above, but who takes a thesis examination during the Summer Session, is required to pay a degree fee of.....$ 10.00
A Master's degree candidate who, in the fall or spring semesters, completes 15 or more semester hours required for the degree and who finishes the work in the Summer Session without a thesis examination is not required to pay the degree fee.

Auditing Fees (See p. 24 for definition):
1. Students registered for a full course program may audit non-laboratory courses (with the permission of the Director) at no extra charge.
2. Students carrying less than a full course program may be granted permission to audit a course or courses on payment of half the University fee per semester hour audited.....$17.50 per s.h.

Late Registration Fee:
Students who fail to register prior to the first class day of a given course will pay an extra fee of.....$ 5.00

Fee for Course Changes:
Course changes other than those required by the University will be made only on payment of an extra fee of.....$ 1.00

Fee for Make-up Final Examination.....$ 5.00

Refund of Fees:
a. When applications for withdrawal are received by the Director of the Summer Session before the close of registration on registration day, full fees will be refunded.

b. When applications for withdrawal are received by the Director of the Summer Session during the first four class days of a given term 80 per cent of the fees will be refunded.

c. When applications for withdrawal are received by the Director of the Summer Session after the fourth class day there will be no refund of fees.

Student Aid

SPECIAL FEES TO TEACHERS: Teachers in full-time service in elementary and in secondary schools, who are accepted by the Summer Session, pay only $15.00 per semester hour. Teachers on leave of absence from their schools and teachers not currently employed are not eligible for this special fee.

SCHOLARSHIPS FOR PUBLIC SCHOOL PERSONNEL: Duke University will offer thirty-six special scholarships of $150.00 each to high school and elementary teachers on a competitive basis (not by a written examination) for the Summer Session of 1965. This scholarship program is designed to encourage teachers to begin or to continue their graduate studies leading to the A.M., M.Ed., or M.A. in Teaching degree.

Duke University will again offer six special scholarships of $200.00 each to high school and elementary administrators and supervisors. This scholarship program is designed to encourage principals and supervisors to continue their graduate studies leading to advanced degrees.

Although successful applicants for the scholarships will not be required to become candidates for a degree, they must qualify for and receive admission to the Graduate School of Arts and Sciences.

All applications with supporting documents must be submitted by April 1, 1965. Selection and appointment of scholars will be completed by May 1, 1965.

Application blanks and complete information may be obtained from the Director of the Summer Session, Duke University, Durham, North Carolina.

LOANS: A number of loan funds have been established for the benefit of the students of Duke University. Several of these funds are available to students enrolled in the Summer Session. These funds are administered through a committee of officers of the University.

The Committee, in approving loans, selects those students who, from the standpoint of character, scholastic attainment, and degree of financial need, are deserving of consideration.

Applicants for loans should make application to the Manager, Student Loan Office, Duke University. All applications must be initiated during the first week of each term. The granting or withholding of a loan is a matter entirely within the discretion of the

Student Loan Committee. A student is expected to use all other possible means of securing financial assistance before applying for aid from a loan fund.

NATIONAL DEFENSE EDUCATION ACT LOANS: A limited number of loans may be made, under the provisions of the National Defense Education Act of 1958, to students in the Summer Session who have been regularly enrolled in the University prior to the Summer Session. Inquiries concerning opportunities available under this program should be addressed to the Manager, Student Loan Division, Duke University.

REMISSION OF TUITION: Children of ministers who are members of the North Carolina and Western North Carolina Conferences of the Methodist Church are entitled to a remission of the tuition charge as are the children of ministers of all faiths residing in Durham County, North Carolina. This consideration is given only to the children of resident members of the two North Carolina conferences who are giving their full time to religious work. The remission of the tuition charge during the Summer Session is valued at one-half of the tuition charge. Only those students enrolled in a regular undergraduate program leading to a baccalaureate degree from Duke University are entitled to this benefit. Students in this group are entitled to a maximum of eight semesters of free tuition at the undergraduate level. Application for this benefit should be made to the Director of Financial Aid, Duke University.

TUITION GRANTS: Tuition grants are available to children of qualified staff members of Duke University. Information regarding the tuition grant program may be obtained by writing to the Director of Financial Aid, Duke University.

Residence Hall Accommodations

The residence hall facilities of Duke University will be available to Summer Session students. The Men's Graduate Center will be used for graduate and professional men students enrolled in the Summer Sessions; however, the Men's Graduate Center dining hall will not serve meals during the Summer Session. Graduate and undergraduate women reside in residence halls on West Campus during the Summer Session.

The Duke University Apartments will be available to married graduate students enrolled in the Summer Session. Information concerning Duke University Apartments will be supplied by the Director of Housing upon receipt of your request.

UNDERGRADUATES, both men and women, are required to live in the residence halls unless they are married or living with par-

ents or relatives. Any exception must be approved in advance by the Dean of Undergraduate Women or the Dean of Undergraduate Men as the case may be.

The majority of the rooms are double rooms furnished for two persons. A limited number of rooms are single and are furnished for one person, and are assigned in the order of receipt of application in the Housing Bureau. The Housing Bureau will convert a double room to a double/single and furnish it for occupancy by one person. Furniture consists of single bed with mattress, clothes closet, a chest of drawers for each person, a study table, chairs, bookcase, waste-basket, and window shades. Linens, blankets, towels, pillows and desk lamps are not furnished by the University.

The Duke University Marine Laboratory, located on Pivers Island adjoining the United States Bureau of Fisheries across the Newport River from Beaufort, North Carolina, has cottage-type residence halls which will be available for Summer Session students. All rooms in the Marine Laboratory residence halls are equipped for two persons. There is a separate building for dining and social activity. Rates for these rooms are the same as shown below. It is not anticipated that there will be any double rooms furnished as single rooms for the Summer Session. Reservations for rooms at the Marine Laboratory, Beaufort, should be made with the Business Manager, Duke University Marine Laboratory, Beaufort, North Carolina, by submitting a Summer Session residence hall application with your personal check for the amount of your room rent.

Residence Hall Rooms—Rates

Single Room	5 weeks' term	$41.25	
	4 weeks' term	33.00	
	3 weeks' term	24.75	
	1 week's term	8.25	
Double Room	5 weeks' term	$70.00	$35.00 per person
	4 weeks' term	$56.00	28.00 per person
	3 weeks' term	42.00	21.00 per person
	1 week's term	14.00	7.00 per person
Double Room furnished as a Single Room and Occupied by one person	5 weeks' term		$56.25
	4 weeks' term		45.00
	3 weeks' term		33.75
	1 week's term		11.25

Applications for room reservations at Duke University, Durham, accompanied by the full amount of the room rent for the term concerned should be made to Director of Housing, Duke University, Duke Station, Durham, North Carolina. Rooms will be reserved in the

order in which applications are received, and on certification of admission by the Summer Session Director. Notification of assignment to rooms will be made about May 30 for the first term; about July 10 for the second term.

Rooms are available to applicants twenty-four hours prior to the registration for a specific term of the Summer Session. A room is to be vacated by the occupant within twenty-four hours after his final examination. Any period of occupancy, other than for a specific term of the Summer Session, must be arranged with the Director of Housing, House D, Room 101-R, Duke University.

REFUND OF ROOM RENT:

a. When notification for room cancellation is received by the Housing Bureau on or before fifteen (15) days prior to the registration date of the Summer Session term full room rent will be refunded.

b. When notification for room cancellation is received between the fifteen (15) days prior to registration date and the first four class days, 80% of the room rent will be refunded.

c. When notification for room cancellation is received after the first four days of a Summer Session term, 70% of the room rent for the unused period will be refunded.

Applicants should be sure to express their preference as to roommates, if they have a preference. If no preference of roommate is expressed the Director of Housing will assign a roommate; however, he does not assume responsibility in this matter.

Estimated cost of one term of Summer Session:

University Fee, 6 s.h.	$210.00
Teachers (elementary and secondary) in full-time service, $90.00	
Dormitory Rooms (2 occupants, $35.00 per person)	35.00
Meals (Cafeteria selective; average per day $2.00)	72.00
Books and Class Materials $7.00 to $10.00	8.50
Miscellaneous (laundry, etc.)	12.00
Total (elementary and secondary teachers in full-time service deduct $120.00)	$337.50

Medical Care

The Student Health Service, in the Duke Medical School Building operates during the Summer Session and offers exactly the same medical and surgical services available to each full-time student during the academic year, as described completely in the Undergraduate Bulletin, but covers only *six days* of hospitalization in each term of Summer Session residence.

With the exceptions noted below, this service, under the direction of the University Physician, and with the cooperation of the staff of Duke Hospital, furnishes full medical and surgical care, drugs, dressings, x-ray work, and ward, but not special nursing, for any acute illness or injury, at no additional cost beyond the University fee for

each term of residence or any shorter period. The cost of braces and necessary orthopedic appliances and of blood, as well as special nursing, must be borne by the student. A charge for meals ($1.80 per day) will be made while the student is in the Hospital. All necessary telephone and telegraph charges will be borne by the student. If students have insurance providing hospitalization, surgical or medical benefits, these benefits shall be applied to the cost of their medical care. Refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions such as diseased tonsils, hernias, elective surgery, chronic skin conditions, endocrine disturbances, etc., or accidents or illness occurring during vacations or while off the campus are not included in this service.

No illness is treated in dormitory or other rooms occupied by students. Students needing treatment for minor medical or surgical conditions have the facilities of the Student Health Office in the Hospital between 9:00 a.m. and 5:30 p.m. on week-days. Emergency room care is available at night and on Saturday afternoons and Sundays. For admission to the Hospital, or for x-ray and consultation services, a student *must* present the 1965 Summer Session Student Identification Card as evidence that he is matriculated in the Summer Session and entitled to hospitalization. Students who register for less than 3 semester hours' credit are not entitled to medical care without charge.

Registration

Definition of Terms

REGISTRATION. A student has completed registration for the Summer Session when:

1. His course program has been written and approved by the dean of the school or college in which he is enrolled or by the Director of the Summer Session in the case of the special or unclassified student.
2. Summer Session forms have been completed properly by the student in the Summer Session Office.
3. Summer Session University fees have been paid. A place in a course cannot be assured until fees have been paid. Tuition bills are not sent to the student's home.

PRE-ENROLLMENT. The term pre-enrollment refers only to the writing of the course program and its approval by the proper authority or by the Director of the Summer Session in the case of the special or unclassified student. *Pre-enrollment alone does not constitute registration.*

General Registration

CLASSES BEGINNING JUNE 14. All Summer Session students whose classes begin on June 14, Term I, who *do not* complete registration in the Summer Session Office, 119 Allen Building, on or before June 5 *must* present themselves at general registration in Central Records Office, 103 Allen Building, on June 12 to register. Students will register during 30-minute periods alphabetically according to *surname* as indicated in the following table.

Time	*Registrants (Surname)*
8:30– 9:00	A–B
9:00– 9:30	C–E
9:30–10:00	F–H
10:00–10:30	I–L
10:30–11:00	Mc–N
11:00–11:30	O–P
11:30–12:00	Q–R
12:00–12:30	S–T
12:30– 1:00	U–Z

CLASSES BEGINNING JUNE 21. All Summer Session students whose classes begin on June 21, Term I, must complete registration in the Summer Session Office, 119 Allen Building, on or before June 19.

CLASSES BEGINNING JULY 20. All Summer Session students who wish to register for courses offered during Term II or for research during Term II may register in the Summer Session Office on July 5 through July 17. All students who *do not* register for second term during this period *must* register in Central Records Office, 103 Allen Building, on July 19, between 8:30 a.m. and 1:00 p.m.

CLASSES BEGINNING ON OTHER DATES. All Summer Session students registering for courses beginning on dates other than those specified above must complete registration in the Summer Session Office *before* the date on which their classes begin. *Registration on the day on which classes are scheduled to begin will be considered late registration.*

Late Registration

Any student who fails to register on or before the dates specified in the preceding paragraphs will be charged a fee of $5.00 for late registration. No student will be permitted to register for a 3 semester hour course after the third class day (June 16, Term I; July 22, Term II); a 4 semester hour course after the second class day (June 22, Term I; July 21, Term II). Changes in courses other than those required by the University will require a payment of $1.00 for each change made. All changes must be approved by the dean of the school or college in which the student is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session. These registration rules are enforced rigidly.

Since Summer Session courses present a program of study in more concentrated and rapid form than in the regular semesters, students are advised to register on time and to be present at all class sessions.

Advance Registration

STUDENTS IN RESIDENCE AT DUKE UNIVERSITY DURING THE SPRING SEMESTER, 1965.

Writing Course Programs in the Schools and Colleges. Students in residence at Duke University during the Spring Semester, 1965, both graduate and undergraduate, who plan to enroll for courses offered in the 1965 Summer Session or to carry on research during the period of the Summer Session will write course programs and have

them approved in their respective schools or colleges during the week of pre-registration, April 6-9, 1965, except Divinity School students who will register on April 15-16.

ADVANCE REGISTRATION IN THE SUMMER SESSION OFFICE. Students in residence whose course programs have been written and approved by their respective colleges on the dates indicated above may complete their registration in the Summer Session Office, 119 Allen Building, on the following dates:

Graduate and undergraduate students—May 10 through June 5

Registration in the Summer Session Office includes:

1. Completion of various Summer Session forms.
2. Payment of University fees.

A student who registers with the Summer Session Office during this period will not be required to be present at general registration on June 12. He will begin his class work on the date his classes are scheduled to begin: June 14 or June 21.

STUDENTS NOT IN RESIDENCE AT DUKE UNIVERSITY DURING THE SPRING SEMESTER, 1965.

ADVANCE REGISTRATION BY MAIL. Students not in residence at Duke University during the Spring Semester, 1965—new undergraduate students seeking to enter as degree candidates, graduate students who are not candidates for an advanced degree at Duke University, graduate and undergraduate students of other colleges and universities desiring to earn credits for transfer, public school teachers and college teachers (not advanced degree candidates)—may register by mail. Advance registration by mail includes:

1. Completion in full of the application form at the end of this *Bulletin.*
2. Admission to the Summer Session by the Director of the Summer Session and, in the case of students seeking to enter Duke University as degree candidates, admission by the Admission Directors to the school or college of Duke University concerned.
3. Completion in full and return of forms required by the Summer Session Office by June 5.
4. Payment of University fees by June 5. A student may *pre-enroll* by mail without paying the University fees but he *cannot register in advance* without doing so.

Students who complete registration by mail on or before June 5 need not be present at the general registration on June 12.

Degree Candidate Graduate Students Not in Residence During the Spring Semester, 1965. All graduate students not in residence during the Spring Semester, 1965, who are candidates for an advanced degree in the Graduate School of Arts and Sciences of Duke University *must* present themselves for registration in Central Records Office, 103 Allen Building, on June 12. They cannot complete registration by mail because:

1. Their program of study for the summer must be approved by their Director of Graduate Studies.
2. Their course programs must be written and approved by the Graduate School of Arts and Sciences.

These students may pre-enroll by mail with the Summer Session Office and may pay their fees in advance, but they cannot complete their registration.

Academic Regulations

Kinds of Course Enrollment

SUMMER SESSION courses may be taken for "credit" or for "non-credit" or may be "audited." A student's program may be exclusively in one of these categories, or may combine any two of them or all three. Students taking a full or partial program for "credit" may enroll as auditors or as non-credit students in any number of additional courses.

CREDIT. The Summer Session term "credit" does not mean degree credit at Duke University unless the student has been admitted as a degree candidate by one of the colleges or schools of the University. A student taking a course for credit is expected to do all the work required and to take the final examination, and he will receive a grade. G.I. Bill benefits are available only to those veterans who enroll for credit.

NON-CREDIT. "Non-credit" enrollment is available to the student who wishes the privilege of participating in class discussions, exercises, and the laboratory assignments but does not wish to take the examinations, either mid-term or final. A "non-credit" student may do as much of the work of the course as he desires, but he may not take the final examination and he will not receive a grade. Full fees of $35.00 per semester hour are required in "non-credit" enrollment.

AUDIT. An auditor is entitled to listen to lectures and class discussions, but he may not participate in discussions or take examinations. Students may not enroll as auditors in laboratory courses. A student carrying a full program for credit may be given permission to audit as many courses as he desires without additional fees. Students carrying less than a full program for credit may secure permission to audit but are required to pay the auditing fee of $17.50 per semester hour.

Eligibility for Course Enrollment

Courses numbered 1-49 are primarily for freshmen, or freshmen and sophomores. Courses numbered 50-99 are ordinarily for sophomores, or sophomores and juniors. Courses numbered 100-199 are designed for juniors and seniors. Courses numbered 200-299 are planned for seniors and graduates. Courses numbered 300 up admit graduate students only. Courses numbered from 200 up are limited in enrollment to 25 students.

Credits Allowed in Summer

The Summer Session courses are of the same quality and credit values as courses in the regular semester. Credit earned in the Summer Session is in terms of semester hours. The majority of Summer Session courses carry 3 semester hours' credit and require one term in residence. A limited number of basic courses in the sciences carry 4 s.h. credit (Chemistry, Geology, Physics, Zoology).

The Normal Course Program

The normal and maximum program for one term of the Summer Session is 6 semester hours, except in cases where students take a 4 semester hour language course. In those cases 7 semester hours per term will be allowed. The 4 semester hour courses in the sciences run for four weeks and one such course constitutes a full course program. Four semester hour courses in the sciences do not meet on Saturdays.

Grading

Only a student taking a course for credit will receive a grade. The grade given represents the quality of the work done in the course.

PASSED.

Undergraduate Grades	*Graduate Grades*
A—excellent	E—exceptional
B—good	G—good
C—average	S—satisfactory
D—poor but passing	

FAILED. A grade of F indicates that the student has failed the course, and in order to receive credit for the course he must repeat the work in class.

INCOMPLETE. A grade of I may be reported by the instructor if for any reason he is unable to report the final grade at the regular time. Incomplete courses must be completed before the close of the succeeding semester; otherwise the I is recorded as F, and the course must be repeated in class if the student is to receive credit for it.

ABSENT FROM FINAL EXAMINATION. The grade X indicates that the student was absent from the regularly scheduled examination. A student absent from examination, if the absence has been excused by the dean of the college or school in which he is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session, may receive an examination upon the payment of $5 to the Treasurer of the University. The instructor concerned arranges for the examination in cases where absences are excused. A student with an X grade who has not obtained a passing grade before the end of the semester following that in which the X was incurred is regarded as having failed in the course concerned and must repeat the work in class in order to receive credit. If a student's absence from an examination is not excused by the dean of the college or school in which he is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session, his grade for the course concerned is recorded as F.

Dropping of Courses

If a student drops a course without permission from the dean of the school or college in which he is enrolled or, in the case of the special or unclassified student, the Director of the Summer Session, the grade for that course is recorded as F. If he drops a course with permission, the grade for that course is F unless, in the judgment of the dean or director, circumstances do not justify this penalty.

Withdrawal from the Summer Session

If a student wishes to withdraw from the Summer Session, he must notify both the dean of the school or college in which he is registered and the Director of the Summer Session.

Examinations

Final examinations in courses are held on the last two days of each term. Final examinations for short courses which occupy the student's complete program will be held on the last day of the course. The examination dates for 1965 are:

First term: July 16, 17.
Second term: August 23, 24.

Courses in science for the first term have been scheduled so that their final examination will come on July 16. The science courses which begin July 20 and run for four weeks will have their final examination on August 17. The University has no provision for giving examinations *in absentia*. Students absent from examinations for valid reasons are permitted a liberal extension of time to return to the University for completion of credit.

Credits for Transfer

A student desiring either graduate or undergraduate credits transferred from Duke University to his university or college as degree credit must request from the Director of the Summer Session, Duke University, a "Course Approval Form" to be completed by the student's Dean or Registrar and return to the Director of the Summer Session, Duke University.

Professional Credits Toward Teacher's Certificates

Professional credits toward teacher's certificates are granted by the various state boards of education, each in accordance with its own carefully planned rules. Teachers in service, before enrolling for certification credit, should consult the rules laid down by their State Board of Education. If necessary, they should send to their State Board of Education a list of the courses in which they plan to enroll and inquire whether these will be acceptable for certification credit.

University Services, Publications, and Student Activities

Appointments Office

THE APPOINTMENTS OFFICE is maintained in Page Building the year around. The services of this Office are available without charge to students and teachers registered for a degree in Duke University and to school officials who may be seeking the services of new teachers. Students interested in securing employment through the Appointments Office should register with this Office.

The University Counseling Center

The University maintains a University Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. This confidential counseling service on problems of personal, social, educational, and vocational adjustment is provided without cost to students enrolled at the University. In addition, the Center administers special group testing programs for University schools and departments and serves as the local testing center for a wide variety of national testing programs. The Center also carries on programs of research in the field of measurement and counseling. Although the counseling, testing, and research services of the Center are designed primarily to meet the needs of the students, the faculty, and the staff of Duke University, these services are made available to individuals and organizations outside the University as its facilities permit. Requests for further information should be addressed to the Director, University Counseling Center, Duke Station, Durham, North Carolina.

Post-Doctoral Research

Scholars engaged in post-doctoral research find it advantageous and sometimes essential to use in summer the resources of the Duke University libraries. The University welcomes these visitors and makes available to them the living accommodations of the dormitories and the dining halls during the Summer Session, June 12 to August 24.

Application for these post-doctoral research privileges must be made in advance by letter to the Director of the Summer Session giving the applicant's present position, the specific field of his research interest, and the dates during which he desires to be in residence. Approved applicants will be accepted subject to the availability of library and of dormitory space.

The Sundial

During the Summer Session the University will publish each Saturday *The Sundial,* an official calendar announcing events—academic, social and recreational—of the following week. This calendar also includes official notices concerning academic requirements. Students are expected therefore to read *The Sundial* regularly.

Recreation and Activities

The Summer Session will provide a varied program of entertainment and recreation. These plans include movies, presented once weekly by Quadrangle Pictures, weekly summer dances and open house social evenings with games for those who do not care to dance. Tours to areas of interest can be arranged for week-ends. Both the mountains and the seashore are easily accessible. Adequate facilities are available for those interested in swimming, tennis, and other sports. State clubs organized for the summer play an active part in all social activities.

Resources of the University



THE UNIVERSITY LIBRARIES, with 1,700,000 volumes and 3,800,000 manuscripts, provide exceptional resources and facilities for study and research by undergraduate and graduate students and visiting scholars. About 60,000 volumes are added annually, while 120 foreign and domestic newspapers and 7,500 periodicals are received currently. There is also a large collection of microfilms of rare books, newspapers, and periodicals. Study facilities are provided for 269 graduate students in air-conditioned stacks of the General Library.

All libraries of the University are open for use throughout the summer. A "Student's Guide to the General Library," and a brochure

on "The Library of Duke University" which describes the building and collections in general detail are available on request addressed to the Librarian of the University.

The laboratories in the various Science Departments (Botany, Chemistry, Physics, Psychology, and Zoology) are designed for both teaching and research. Ideal locations for special work in some of the sciences are available at Duke University Marine Laboratory at Beaufort, North Carolina; at Highlands Biological Laboratory at Highlands, North Carolina; in the Duke Forest at Durham, North Carolina; and in the Sarah P. Duke Gardens on the West Campus of Duke University.

The Chapel, home of Duke University Church, interdenominational, is open all summer. The Church encourages the cultivation of the spiritual and moral life of students through participation in the service of worship which is held each Sunday morning at nine-thirty o'clock. The pulpit is occupied by a regular University Preacher, or a special visiting preacher. Choral music for these services is provided by a volunteer student choir.

Special Conferences and Courses

SPECIAL PROGRAMS FOR TEACHERS OF SCIENCE AND MATHEMATICS: It is anticipated that the Summer Session will offer a number of special programs at the graduate level designed specifically for high school teachers of science and mathematics. For detailed information on the programs, teachers should write Dr. Thomas Reynolds, Mathematics Department, Duke University, Durham, North Carolina.

CONFERENCE ON SCHOOL LAW: A conference on school law will be held on Duke University campus on June 22-23. The program is planned for the benefit of administrators and teachers in schools and colleges. Speakers and consultants well known in the field of school law will participate in the two-day conference.

CONFERENCE ON ELEMENTARY EDUCATION: June 17-18, 1965. This conference is the eleventh of a series of conferences dealing with various areas of learning in the elementary school. The area of learning to be considered in this conference will be art. Mr. Al Hurwitz, Supervisor of Art Education for the Dade County Schools, Miami, Florida, a nationally known authority in the field will be the consultant and main speaker for the conference. Mr. Hurwitz has

worked with children in art for several years. He has conducted TV classes, written, and lectured on the subject. He is highly recognized for his understanding of the problems of the Art Education program in the public schools. For further information write to the Director of the Summer Session, Duke University, Durham, North Carolina.

MODERN MATHEMATICS WORKSHOP FOR ELEMENTARY TEACHERS: The Duke University Summer Session with the cooperation of the North Carolina State Department of Public Instruction will offer a two-week workshop in modern mathematics for elementary teachers, June 17 to July 2.

The workshop will be instructional with emphasis on various topics of the content presently being stressed in the contemporary mathematics programs in the elementary grades. Participants in the workshop will be granted 2 s.h. credit for the workshop.

Registration fee for the workshop is $30.00 for public school teachers. There are *fifteen* $30.00 scholarships available for North Carolina public elementary teachers. For further information and application write to the Director of the Summer Session, Duke University, Durham, North Carolina.

SUMMER INSTITUTE IN ENGLISH: The Department of English in conjunction with the North Carolina State Department of Public Instruction will offer during Term I (June 12-July 17) an Institute for teachers of English in the secondary schools. The Institute will include instruction in Literature, Language, and Composition, as described in the Courses of Instruction below. The Institute will follow the general plan of the Institute offered in the summer of 1962 in conjunction with the Commission on English of the College Entrance Examination Board. The syllabi prepared under the supervision of the Commission on English will be employed. The instruction will carry graduate credit which may be applied to a degree program here or elsewhere. The Institute will be limited to about thirty teachers, all of whom will receive full tuition scholarships. For further information write: Director, Summer Institute, English Department, Duke University, Durham, North Carolina.

SOUTHEASTERN INSTITUTE OF MEDIEVAL AND RENAISSANCE STUDIES: The Southeastern Institute of Medieval and Renaissance Studies has been established for the advancement of scholarship and the improvement of teaching in the southeastern region. Through the Institute the resources of Duke University and the University of North Carolina—particularly library holdings—will be made available to scholars and teachers throughout the region. Students of all areas of medieval and renaissance studies will participate. The Institute will alternate annually between the campuses of Duke University and the University of North Carolina at Chapel Hill.

The first session, from July 19 to August 25, 1965, will be held on the University of North Carolina campus.

HIGHLANDS BIOLOGICAL STATION: Duke University holds a subscribing instructional membership in the Highlands Biological Station at Highlands, North Carolina, on the southern edge of the Blue Ridge Mountains at an elevation of 4,118 feet. The situation and the region offer an excellent opportunity for field studies and limited laboratory work. A limited number of qualified students in Botany and Zoology may make arrangements to carry out research at this station.

MEDICAL MYCOLOGY: A month's course in Medical Mycology, under the direction of Dr. Norman F. Conant, is to be offered at Duke University School of Medicine and Duke Hospital, July 5 to July 31, 1965. The course will be offered every day in the week, except Sunday, and has been designed to insure a working knowledge of the human pathogenic fungi within the time allotted.

Emphasis will be placed on the practical aspects of the laboratory as an aid in helping establish a diagnosis of fungus infection. Insofar as possible and as patients become available, methods of collecting materials in the clinic for study and culture will be stressed. Work with patients, clinical material, cultures, and laboratory animals will serve as a basis for this course. Also, an opportunity to study pathologic material, gross and microscopic, will be given those whose previous training would allow them to obtain the greatest benefit from a study of such material.

The enrollment for the course will be limited and the applications will be considered in the order in which they are received. An attempt will be made, however, to select students on the basis of their previous training and their stated need for this type of work.

A fee of $100.00 will be charged for this course, upon the completion of which a suitable certificate will be awarded. Please direct inquiries to Dr. Norman F. Conant, Professor of Microbiology, Duke University School of Medicine, Durham, North Carolina.

THE METHODIST COURSE OF STUDY SCHOOL: The seventeenth session of the short-term school for Methodist ministers taking the required Course of Study will be conducted during the period, July 12-August 6, 1965. While this school is designed primarily for Supply Pastors and other non-seminary candidates for the Methodist ministry, clergymen of any denomination may enroll. The curriculum as approved by the 1964 Methodist General Conference will be followed, which will include Studies for License to Preach, Introductory Studies and the Studies for the First, Second, Third, and Fourth Years.

In addition to class work, there is provision for daily worship and a number of special lectures and workshops. A varied program of recreation and athletics will be supervised by the University Department of Physical Education.

Registration is scheduled for July 12. Classes begin on the morning of July 13 and continue through August 6. A descriptive folder giving details of the School will be ready for distribution about March 1, 1965, and copies may be procured by writing to Professor W. A. Kale, Director, Box 4353, Duke Station, Durham, N. C.

Divinity School Summer Clinics

Three clinics, Preaching, Pastoral Care, and Rural Church Work will be held simultaneously, July 19-30, 1965. Costs include: Registration Fee, $10.00, Tuition, $40.00, and Board and Room. All participants are eligible for Tuition Grants. In addition, Methodist Ministers in North Carolina may inquire about special grants provided by agencies of the Annual Conferences to cover costs. Registration is open to ministers of all denominations. No academic credit is given.

PREACHING: This is the eighth Clinic in Preaching to be held at Duke. Registration is limited to eighteen in number, preferably restricted to active ministers and chaplains who have been out of seminary five years or more. The Clinic will concern itself mainly with principles of sermon construction and delivery, giving ample opportunity for the participants to preach for critique. Matters of common concern for preachers will be discussed in plenary sessions. For registration information write to Professor Thor Hall, Director.

PASTORAL CARE: The Clinic in Pastoral Care has as its theme the psychological and theological dimensions of selfhood. Through lectures, discussions, hospital visitation, and verbatim conferences aspects of the theme are explored: the meaning of selfhood, the self in crisis and the ministry of the Church to those caught in the crisis of illness, the action of God in the midst of suffering, and the personal and sacramental means of grace. Hospital visitation supervised by the Chaplains to the Duke Medical Center forms an integral part of the program. For registration information write to Professor Richard A. Goodling, Director.

RURAL CHURCH: The Rural Church Clinic will consist of intensive training, study, and planning in the area of the Church's responsibilities in the town and country community, giving particular emphasis to the development of an indigenous leadership. For registration information write to Professor M. Wilson Nesbitt, Director.

Graduate Study in the Summer Session

Summer Sessions offer an excellent opportunity to advance or complete programs of graduate study already undertaken, to begin study toward a graduate degree at Duke University, to acquire graduate training useful in professional advancement, or to study for personal satisfaction. The several departments offer a variety of graduate courses, as listed in later pages, given by members of the Duke faculty and visiting professors. Especially full programs are provided in Botany, Education, English, History, Psychology, Sociology, and Zoology.

Students Not Seeking Admission to the Graduate School. Any student who holds an A.B. or B.S. degree and who does not intend to earn an advanced degree at Duke University but who desires graduate work for professional or other reasons should apply to the Director of the Summer Session for admission as an unclassified student. Credit earned by an unclassified student will serve all usual purposes except that it will not count toward an advanced degree at Duke University.

Students Seeking Admission to the Graduate School. Admission may be granted to a student who has received an A.B. or B.S. degree from an accredited institution after a four-year course of study. The undergraduate record should be well rounded and of such quality as to give evidence of real capacity for success in graduate study. A student who seeks admission should 1) secure an application blank from the Graduate School and promptly return it with the required information, 2) have mailed directly from the registrar of each college he has attended to the Dean of the Graduate School at Duke University an official transcript of all his undergraduate or graduate work, 3) have mailed to the same official at least two, and preferably three, letters of recommendation from persons best qualified to appraise his capacity for graduate study.

In addition, many departments welcome, the departments of Economics and Psychology strongly advise, and the departments of Biochemistry and Philosophy require, submission of scores on the aptitude and advanced test in major subject of the Graduate Record Examination. If possible, the student should take this examination before his intended registration. Arrangements can usually be made through officials at the student's college or by correspondence with the Educa-

tional Testing Service, 20 Nassau Street, Princeton, New Jersey. Should a student be unable to take the examination before the final admission date, he may—if his other documents are acceptable—be granted "provisional" admission until he takes the examination, which he must arrange to take at the first time it is offered after his "provisional" admission. Students admitted to the Graduate School will be so notified by the Director of Admissions.

So that applications for admission to the Graduate School for summer work may be given full consideration, the student must submit all required documents to the Dean of the Graduate School at least ONE MONTH before the date of intended registration. No student may register with the Graduate School until his application has been completed and admission has been granted.

Registration of Graduate Students

Graduate students in residence during the spring semester will pre-register for either or both terms of the Summer Session on April 6-9. Other students who have been admitted to the Graduate School should present themselves for registration at the official registration period, June 12 for the first term, and July 19 for the second term. They are required to register both with the Summer Session and the Graduate School.

Graduate students intending to remain in residence during either or both of the two Summer Session terms without registering for course work or research must register for one unit (one semester hour) to cover the cost of medical care and the use of University facilities. This one unit (one semester hour) of registration will entitle students to use the Student Health Service and University facilities during both terms of the Summer Session.

Transfer of Graduate Credits

1) For regulations concerning applying graduate credit earned elsewhere to a graduate program here, consult the *Graduate School Bulletin*.

2) The long-standing reciprocal agreement with the Consolidated University of North Carolina (see *Graduate School Bulletin*) is now effective during the respective Summer Sessions of this University and the University of North Carolina. It is restricted to a graduate student who has registered for a full program during at least one semester of the preceding academic year. Such a student by enrolling in the home Summer Session and paying its normal fees may register for a maximum of 3 semester hours at the other institution upon payment

of a nominal fee of $2.00. Credit so earned is not defined as transfer credit.

The Ph.D. and Ed.D. Degrees

Study for the Ph.D. Degree: Students who are interested in working toward a Ph.D. degree should note in detail the requirements as outlined in the *Bulletin* of the Graduate School of Arts and Sciences. Requirements for the Ph.D. include one academic year of full-time residence.

Study for the Ed.D. Degree: Students who are interested in working toward an Ed.D. degree or for advanced certificates for principals and supervisors should consult the detailed statement in the *Bulletin* of the Graduate School of Arts and Sciences. Requests for specific information regarding residence and programs for the Ed.D. degree should be sent to the Director of Graduate Studies, Department of Education.

Requirements for Master of Arts Degree

Language Requirements: The candidate for the A.M. degree must have a reading knowledge of at least one foreign language. (The several departments reserve the right to specify which foreign languages are acceptable.) The language requirement is met by successfully passing examinations as follows:

a. For French, German, and Russian students admitted in September, 1964 and thereafter take the Educational Testing Service examination given at the Duke University Counseling Center and elsewhere. Students who were admitted before September, 1964 may take either these examinations or the regular reading examination offered by the respective departments.

b. For Spanish the department reading examinations will be taken by all students.

c. For other languages, special examinations must be requested.

Major and Minor Subjects: As a prerequisite to graduate study in his major subject, the student must have completed a *minimum* of 12 semester hours of approved college courses in that subject, and 12 additional semester hours in that subject or in related work. Since some departments have specific requirements for undergraduate preparation, the student should read carefully the special requirements listed by his major department, which are included as headnotes to the course offerings in the *Bulletin* of the Graduate School.

To complete the course requirements for the A.M. degree, the student must take 24 units of graduate courses, of which at least 12

must be in the major subject. Of the remaining 12 he must take 6 units of course work in a minor subject, leaving 6 units of course work to be taken in either the major or minor field, or in another field approved by the major departments and the Dean of the Graduate School. In addition to the course work, the student must present a thesis which carries a credit of 6 units. Thus, the total credit required for the A.M. degree amounts to 30 units.

The Thesis for the Master of Arts Degree: The thesis for the A.M. degree should demonstrate the student's ability to collect, arrange, interpret or report pertinent material on his special research problem. Although a publishable document is not required, the thesis must be written in a literate style, and should exhibit the student's competence in scholarly methods and procedures.

Regulations and Procedures: Students expecting to complete all requirements for a Master's degree should file with the Graduate School office *not less than one month* prior to first presentation of the thesis a declaration of intention to receive the degree and a thesis title. Candidates completing requirements for a Master's degree without thesis should file the same official blank *one month* prior to completion of all degree requirements. Official blanks may be obtained from the Graduate Office or from the Director of Graduate Studies in the student's major department.

Four typewritten copies of the thesis, in the spring binders provided by the Duke University Library, must be submitted, in approved form, to the Dean of the Graduate School at least *three to five days* before the date of the thesis examination. The copies will then be distributed to the several members of the examining committee.

The Examining Committee and the Examination: After consultation with the professor who has directed the thesis work, the Director of Graduate Studies in the major department appoints an examining committee composed of the director of the thesis as chairman and two other members of the graduate faculty, one of whom should represent the minor department. The committee composition is subject to approval by the Dean of the Graduate School. The candidate appears before this committee for an examination, which lasts for about one and one-half hours. The subject matter covered in the examination is usually restricted to the thesis and to the major field.

If the candidate passes his examination, the examining committee certifies to this fact by signing the title page of the ribbon copy and first carbon copy of the thesis. The candidate then returns the original and first carbon copy of the thesis to the Dean of the Graduate School for binding and deposit in the University Library.

Requirements for the Master of Education Degree

Prerequisites: The degree of Master of Education is granted ordinarily only to teachers or to others engaged in educational work.

Before a student is admitted to graduate study for this degree, he should have completed, on the undergraduate level, a minimum of 18 semester hours of approved work in Education.

Requirements for the Degree: The M.Ed. degree may be earned either with or without the presentation of a thesis.

Without Thesis: The required work includes a departmental major (Elementary Education, Administration, Counseling, or Secondary Education) of at least 12 units, and a minor of at least 6 units outside the Department of Education. The remaining 12 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

Toward the end of his residence the student must pass a comprehensive examination on his departmental major. Permission to take such examination must be obtained from the Director of Graduate Studies of the Department of Education, and a notice of intention must be filed with him *at least two weeks* before the announced dates of the examination.

With Thesis: Students who elect this plan are permitted to substitute a thesis for 6 units of the required course work. The thesis subject must be approved by the professor who is to direct it and by the Director of Graduate Studies. Students expecting to complete all requirements for a Master of Education degree should file with the Graduate School Office *not less than one month* prior to first presentation of the thesis a declaration of intention to receive the degree and a thesis title. Official blanks may be obtained from the Graduate Office or from the Director of Graduate Studies in the Department of Education.

In addition to the thesis, the student must present at least 24 units of course credit. Of these, 12 units must be taken in the student's departmental major. Six units, constituting a minor, must be taken outside the Department of Education. The remaining 6 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

The regulations concerning the writing and submission of the thesis, and the examination of it, are the same as those governing the thesis for the Master of Arts degree.

The Master of Arts in Teaching Degree

Prerequisites: The degree of Master of Arts in Teaching is designed for teachers already in service and for recent graduates of liberal arts colleges who wish to enter public school teaching.

A student should normally have completed a minimum of 12 semester hours in his proposed major subject and an additional 12 semester hours in that or related subjects. In the event that a student wishes to undertake a graduate major different from the undergraduate major, the prerequisites may be modified upon the recommendation of the student's committee and the approval of the Dean of the Graduate School.

Programs for the Degree: One of two programs may be arranged, in consultation with the student's committee:

A. A major in Education of 18 to 24 units and 6 to 12 units in courses outside the Department of Education.

B. A major in a department other than Education of 18 to 24 units and 6 to 12 units in Education.

In both programs a minimum of 30 units is required.

The non-education courses are to be taken in one or more subjects ordinarily taught in the secondary schools. The amount and distribution of this work will be determined by the needs of the individual student.

The Master of Arts in Teaching may be earned with or without the presentation of a thesis. If a student, in consultation with his committee, elects to present a thesis, 6 units of the total of 30 units required will be allotted to thesis research. He will then be required to complete 24 units of course credits. The regulations concerning the writing and submission of the thesis, and the examination on it, are the same as those governing the thesis for the Master of Arts degree.

Candidates for the Master of Arts in Teaching who have not had teaching experience must major in Education and are required to take Education 215 (or 315) and 216, in which case a minimum of 36 units is required.

The Committee: Each candidate for the degree will be assigned a committee, appointed by the Director of Graduate Studies in his major department, to plan his program of study.

This committee will consist of three members, at least one of whom will be from the Department of Education, and at least one from another department. The chairman of the committee will normally be chosen from the department of the major.

Cooperative Program in Teacher Education

Thirty to thirty-five selected graduates of liberal arts colleges who desire to prepare for high-school teaching will be admitted to a special internship program at Duke University. This program is designed to prepare for a teaching career selected college graduates who did not qualify professionally for teacher certification as undergraduates. The Cooperative Program provides, for candidates who are chosen, graduate study in their special fields, professional courses, and carefully supervised observation and teaching experience. One who completes the program successfully can achieve within a period of fifteen months a year of teaching experience, a Master of Arts in Teaching degree, and full certification as a teacher.

Candidates will begin the program at the opening of the Summer Session of 1965 and complete it in August of 1966. They will spend the summer preceding and the summer following the year of teaching in residence at the University. During the school year 1965-1966 interns will be employed as regular teachers in a cooperating public school system. During this year they will receive full salary and will work under the joint supervision of the cooperating public school and the University. The program will meet training qualifications for the advanced, or graduate, teacher's certificate in many states.

The salary for the year of teaching will, in effect, constitute a substantial award to candidates selected for the program. Interns will benefit from Duke University's special tuition rate for teachers. Applicants will be considered, as are candidates for other awards, on a competitive basis. The best-qualified applicants will be chosen on the basis of undergraduate record, recommendations, and evidence of interest in becoming high-school teachers. Applicants are required to arrange interviews in connection with their applications. Application forms may be secured by addressing a request to the Dean of the Graduate School and must be submitted before February 15, 1965. Details concerning the program can be obtained by writing the Director, Cooperative Program in Teacher Education, Department of Education, Duke University.

Requirements for the Master of Science Degree

Prerequisites: The degree of Master of Science is offered in the fields of Civil, Electrical, and Mechanical Engineering. As prerequisites to this degree the student must have earned a Bachelor's degree from an accredited engineering college and have completed a minimum of 12 semester hours' work in the major field.

Foreign Language: There is no foreign language requirement for this degree.

Major and Minor Subjects: The work for the Master of Science degree is designed to provide a broad basic foundation in the science of Civil, Electrical, or Mechanical Engineering. The student must present acceptable grades for a minimum of 24 units of graduate courses. Of these, at least 12 units must be in the major area. He must also take a minimum of 6 units of minor work outside of engineering and 6 units in the major, minor, or another approved area. In addition to these he must present a thesis, which carries a credit of 6 units. Thus his earned credit for the degree totals a minimum of 30 units.

Regulations and Procedures: The regulations and procedures and the provisions for examination and an examining committee are the same as those for the Master of Arts degree.

Candidacy for the Master's Degree

To be considered as a candidate for a Master's degree (A.M., M.S., M.Ed., M.A.T.) the graduate student must (1) have made passing grades in all courses taken during the first period of residence (if he registers for fewer than 12 units of graduate courses during the first period of residence, he must make passing grades on the initial 12 units of graduate courses), (2) have made a grade of "G" or "E" on at least 3 units of this work, and (3) have received the approval of the major department (or in the case of the M.A.T. of the supervisory committee).

Transfer of Credits

Under certain circumstances a maximum credit of 6 units in a Master's degree program may be allowed for graduate courses completed elsewhere. Approval for the transfer of credits will not be given until the student has spent one semester or two terms in residence. The acceptance of credit up to this amount will not reduce the minimum period of full-time registered residence at Duke University. In no case will credit be allowed for extension or correspondence courses.

With the approval of both the student's major department and the Dean of the Graduate School, a student who is granted such transfer for credit may be permitted to register for as much as 12 units for thesis research instead of the usual 6 units. Or he may be permitted to fill out his schedule with as much as 6 semester hours of further undergraduate training or 6 semester hours of required language courses on the undergraduate level.

Time Limits for Completion of the Master's Degree

The candidate for a Master's degree who is in residence for consecutive academic years should complete all requirements for the degree within two calendar years from the date of his first registration in the Graduate School. Any candidate must complete all requirements within six calendar years of his first registration.

Undergraduate Study

UNDERGRADUATES in Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending two or more summer sessions. By attending both terms of the Summer Session it is possible for a student to earn as many as twelve semester hours of credit. Instruction of interest to undergraduates will be offered in the summer of 1965 in most of the departments and colleges.

Undergraduates from other colleges and universities may enroll for summer instruction at Duke and transfer their earned credits to their own institutions.

School of Nursing

The programs of the School of Nursing include courses in the Summer Session. Persons desiring to enroll in courses to meet the requirements of the School of Nursing programs must be regularly enrolled students. Students who have been admitted with Advanced Standing and who may wish to make up deficiencies in the Summer Session must have courses approved by the School of Nursing. Information about required courses is published in the regular *Bulletin of the School of Nursing*. For further information write to the Dean of the School of Nursing, Hanes House, Duke University, Durham, North Carolina.

Divinity School Studies

BACHELOR OF DIVINITY, MASTER OF THEOLOGY, AND MASTER OF RELIGIOUS EDUCATION: The degrees of Bachelor of Divinity, Master of Theology, and Master of Religious Education are administered by the faculty of the Divinity School. A limited number of courses carrying credits toward these degrees is listed in this *Bulletin* under the heading of Religion. Persons desiring credit toward one of these degrees must be regularly admitted to the Divinity School, and all courses listed for Divinity School credit must be registered and approved in the office of the Divinity School. This school publishes its own Summer Session Bulletin, a copy of which may be secured by addressing The Office of the Dean, The Divinity School, Duke Station, Durham, North Carolina.

Courses of Instruction

Minimum Enrollment Required for Courses

All courses are offered subject to minimum enrollments. The University reserves the right to withdraw undergraduate courses in which fewer than twelve students enroll, senior-graduate courses numbered 200-299 in which fewer than ten students enroll, and graduate courses and seminars numbered 300 or above in which fewer than six students enroll. In withdrawing a course, the University attempts to avoid undue hardships on students. Sometimes, therefore, courses are offered in spite of small enrollments. Courses not listed will be given when a demand develops and an instructor is available.

Department Officers and Regulations

Departments offering Summer Session programs are listed alphabetically. Under each department is given the name of the chairman and the name of the director of graduate studies. Where departments have set up special regulations for admission to candidacy for the Master's degree, these are included.

BOTANY

ASSOCIATE PROFESSOR T. W. JOHNSON, JR., CHAIRMAN—141 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS); PROFESSOR W. D. BILLINGS, DIRECTOR OF GRADUATE STUDIES—142 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS)

Students admitted to candidacy for an advanced degree in botany should have completed a minimum of 12 semester hours of courses in botany (or biology) beyond an elementary course, and related work in biological sciences. Students who have not yet had the minimum hours, however, may enter higher courses by permission of the instructor, if he is convinced that they can carry the work for undergraduate credit, and may count such work toward hours necessary for candidacy.

FIRST TERM (Duke Campus)

225. SPECIAL PROBLEMS.—Hours to be arranged. STAFF

359. RESEARCH.—Hours to be arranged. STAFF

FIRST TERM (Duke Marine Laboratory, Beaufort, North Carolina)

220. COASTAL FIELD BOTANY.—Survey of the regional flora with attention to ecological associations of the Beaufort area. Daily field trips for collection and intensive study study of the rich vascular flora. Prerequisite: One year of college biological science. 6 s.h. WILBUR

225. SPECIAL PROBLEMS.—Hours to be arranged. HUMM AND JOHNSON

359. RESEARCH.—Hours to be arranged. HUMM AND JOHNSON

SECOND TERM (Duke Campus)

226. SPECIAL PROBLEMS.—Hours to be arranged. STAFF

360. RESEARCH.—Hours to be arranged. STAFF

SECOND TERM (Duke Marine Laboratory, Beaufort, North Carolina)

211. MARINE ALGAE.—Classification, taxonomy, morphology, distribution, ecology, and economic uses of marine algae; preparation of herbarium material. In addition to collection, field work will provide students an opportunity to observe associations of marine algae *in situ* by means of diving equipment, if they wish to use it. 6 s.h. SILVA

226. SPECIAL PROBLEMS.—Hours to be arranged. HUMM AND JOHNSON

360. RESEARCH.—Hours to be arranged. HUMM AND JOHNSON

CHEMISTRY

PROFESSOR J. H. SAYLOR, CHAIRMAN—115 CHEMISTRY BUILDING (WEST CAMPUS); PROFESSOR CHARLES K. BRADSHER, DIRECTOR OF GRADUATE STUDIES—124 CHEMISTRY BUILDING (WEST CAMPUS)

All classes in Chemistry, Term I, will begin on June 21 and continue through July 17. All classes in Chemistry, Term II, will begin on July 20 and continue through August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* on page 20 of this *Bulletin*. (Chemistry classes will not meet on Saturdays.)

FIRST TERM

1. GENERAL INORGANIC CHEMISTRY.—Lectures, recitations, and laboratory work on the elementary principles of chemistry and on the occurrence, preparation, properties, and uses of the elements and their compounds. Laboratory daily, 8:30-10:00; recitation daily, 11:00-12:00; lecture daily, 12:00-1:00. 4 s.h. BONK

61. FUNDAMENTALS OF ANALYTICAL CHEMISTRY.—A study of the relations of electrolytes in solution and of chemical equilibrium illustrated by laboratory experiments involving the techniques of gravimetric, volumetric, and colorimetric analysis. Prerequisites: Chemistry 1-2 and Mathematics 21 or equivalent. Lecture or recitation daily, 8:30-10:00; laboratory daily, 10:30-12:30 and 1:30-4:00. 4 s.h. JONES

151. ORGANIC CHEMISTRY.—An introduction to the study of carbon compounds. Compounds of the aliphatic series form the basis of lectures, discussions and laboratory experiments. Prerequisite: Chemistry 61. Recitation daily, 8:00-9:00; laboratory daily, 9:00-12:00; lecture daily, 12:00-1:00. 4 s.h. BROWN

275. THESIS RESEARCH.—Research in the fields of physical, analytical, inorganic, or organic chemistry. Open to those students whose research programs for the A.M. and Ph.D. degrees have been approved by the department and by one of the instructors in charge of the course. Schedule to be arranged. (Not more than one semester hour of credit per week for full-time schedule or one semester hour each two weeks for half-time schedule.) 2 to 8 s.h. Available Terms I and II.

SECOND TERM

2. GENERAL INORGANIC CHEMISTRY.—A continuation of 1. Prerequisite: Chemistry 1. Laboratory daily, 8:30-10:00; recitation daily, 11:00-12:00; lecture daily, 12:00-1:00. 4 s.h. HILL

152. ORGANIC CHEMISTRY.—A study of compounds of the aromatic series and of carbohydrates and proteins. Prerequisite: Chemistry 151. Recitation daily, 8:00-9:00; laboratory daily, 9:00-12:00; lecture daily, 12:00-1:00. 4 s.h. MEYER

CLASSICAL STUDIES

PROFESSOR ROBERT S. ROGERS, CHAIRMAN AND DIRECTOR OF UNDERGRADUATE STUDIES IN LATIN—204 CARR BUILDING (EAST CAMPUS); PROFESSOR JAMES N. TRUESDALE, DIRECTOR OF UNDERGRADUATE STUDIES IN GREEK—105 LANGUAGE BUILDING (WEST CAMPUS)

GREEK

FIRST TERM

121. GREEK LITERATURE: HOMER—*Iliad* and *Odyssey*.—The purpose of this course is to give a general survey of the life and civilization of the Greeks, especially to those who have never studied the language but wish to become acquainted with some of the choicest portions of the literature by the use of translations. The *Iliad* and the *Odyssey* are read in translation, and the excavations and discoveries at Troy and other cities of the Aegean age are discussed. 7:40-9:00. 3 s.h. Stanley

122. GREEK LITERATURE: THE TRAGIC POETS.—The purpose of this course is similar to that of course 121. Many of the extant plays of Aeschylus, Sophocles, and Euripides are studied in English translations. 9:20-10:40. 3 s.h. Stanley

LATIN AND ROMAN STUDIES

FIRST TERM

63. CICERO'S ORATIONS.—Selected orations of Cicero are read with attention to prose style. Prerequisite: Latin 1-2, or equivalent. 7:40-9:00. 3 s.h. Wooley

64. VERGIL'S AENEID.—Selections are read and interpreted, with due attention to prosody, and discussion of the literary excellence of the work. 11:00-12:20. 3 s.h. Wooley

111. ROMAN LITERATURE IN ENGLISH TRANSLATION.—Selected readings of Latin literature in English translation with emphasis on the drama, lyric poetry, and the varied contributions of Cicero to literature. 9:20-10:40. 3 s.h. Settle

112. ROMAN LITERATURE IN ENGLISH TRANSLATION.—Selected readings of Latin literature in English translation with emphasis on the epic, the satire, and the novel. 11:00-12:20. 3 s.h. Settle

COMPARATIVE LITERATURE

FIRST TERM

205. FOUNDATIONS OF TWENTIETH-CENTURY EUROPEAN LITERATURE.—The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Anouilh, Lagerkvist, Camus) evolving toward a mythology of man. 9:20-10:40. 3 s.h. Salinger

ECONOMICS

PROFESSOR ROBERT S. SMITH, CHAIRMAN—306 SOCIAL SCIENCE BUILDING (WEST CAMPUS); PROFESSOR FREDERICK C. JOERG, DIRECTOR OF UNDERGRADUATE STUDIES—316 SOCIAL SCIENCE BUILDING (WEST CAMPUS); PROFESSOR JOSEPH J. SPENGLER, DIRECTOR OF GRADUATE STUDIES—322 LIBRARY (WEST CAMPUS)

FIRST TERM

51. PRINCIPLES OF ECONOMICS.—A course in the essential principles of economic science. (Credit for Ec. 51 will not be given until Ec. 52 has been completed.) 9:20-10:40. 3 s.h. Wallace

57. PRINCIPLES OF ACCOUNTING.—Elementary principles of single proprietorship, partnership, and corporation accounting. June 14-June 30. 7:40-12:20. 3 s.h. Keane

58. PRINCIPLES OF ACCOUNTING.—A continuation of Economics 57. July 1-July 17. 7:40-12:20. 3 s.h. Keane

138. BUSINESS STATISTICS.—A survey of the principal statistical methods and their application to economics and business administration. The course deals with collection of statistical data, construction of statistical tables and charts, and

a brief study of the fundamental statistical concepts and techniques. 11:00-12:20. 3 s.h. WALLACE

143. CORPORATION FINANCE.—Principles and problems in the financial organization of corporations; the study of corporate securities, the management of capital, the distribution of earnings; industrial combinations; insolvency and reorganization. Prerequisite: Economics 57-58, Principles of Accounting. 9:20-10:40. 3 s.h. JOERG

181. BUSINESS LAW.—The fundamental principles of law as applied to routine business transactions. The topics presented are: contracts, agency, and negotiable instruments: 7:40-9:00. 3 s.h. JOERG

SECOND TERM

52. PRINCIPLES OF ECONOMICS.—A continuation of Economics 51. 9:20-10:40. 3 s.h. NAYLOR

153. MONEY AND BANKING.—The lender's side of financial markets. The activities of commercial banks and other financial institutions in supplying loanable funds and the effects of these activities on the money supply and its rate of use, the impact of central bank and Treasury operations on financial markets, and the evolution of the present monetary system and its institutions. 11:00-12:20. 3 s.h. NAYLOR

286. LATIN AMERICAN ECONOMICS.—A survey of the problems of economic development in twenty countries. 9:20-10:40. 3 s.h. SMITH

EDUCATION

PROFESSOR WILLIAM H. CARTWRIGHT, CHAIRMAN—08D WEST DUKE BUILDING (EAST CAMPUS); PROFESSOR EDWARD C. BOLMEIER, DIRECTOR OF GRADUATE STUDIES—08D WEST DUKE BUILDING (EAST CAMPUS)

Duke University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's degree as the highest degree approved.

For admission to candidacy for the Master of Arts (A.M.) degree with major in Education, or for the Master of Education (M.Ed.) degree, students must, in addition to meeting the general requirements for admission to the Graduate School, meet the following specific requirements: Credit for (1) eighteen semester hours of acceptable prior work in Education and (2) twelve semester hours of acceptable prior work in a minor field. If Psychology, Sociology, Economics, or Political Science is chosen for the minor, six semester hours of work completed after entering the junior year in college will be accepted.

The degree of Master of Arts is available in the divisions of School Administration and Supervision, Secondary Education, Elementary Education, and Guidance and Counseling. Every candidate for the Master of Arts degree in the Department should elect at least twelve semester hours in one of these divisions in which he plans to write his thesis and the remainder of his work, including the six semester hours in his minor, with the approval of the proper division adviser. The degree of Master of Education is available in the divisions of School Administration and Supervision, Secondary Education, Elementary Education and the Teaching of Emotionally Disturbed Children. Mr. Bolmeier, Mr. Hurlburt, and Mr. Stumpf are advisers to students in School Administration and Supervision; Mr. Petty, Mr. Sublett and Miss Rudisill are advisers in Elementary Education; Mr. Bolmeier, Mr. Cartwright, Mr. Githens, and Mr. Shuman are advisers in Secondary Education; and Mr. Colver, Mr. Gehman, and Mr. Weitz are advisers in Guidance and Counseling. Mr. Cartwright and Mr. Hurlburt are advisers for the Master of Arts in Teaching program. Candidates for the Master of Arts, Master of Education, or Master of Arts in Teaching degree should read with special care the regulations of the Graduate School as set forth on pages 33-41. Candidates for the Master of Arts in the field of guidance should consult the special brochure on guidance available from the Dean of the Graduate School.

It is the intention of the Department to make available to degree candidates all courses ordinarily required for certification as graduate teachers, counselors, principals and superintendents. These courses will normally be offered at least once every three years.

FIRST TERM

107. ELEMENTARY EDUCATION: ARITHMETIC.—The processes, methods, and materials basic to the teaching of arithmetic in the elementary school. Required in the elementary-education major. (June 17-July 2.) 11:00-12:20 plus Monday and Wednesday, 2:00-4:00. 2 s.h. Sandefur and Petty

(Persons participating in the Contemporary Mathematics for Elementary Teachers' Workshop will also participate in this course.)

201. TEACHING AND SUPERVISION OF ARITHMETIC.—Special attention is given to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. Considered also are the meaning theory, methods of teaching, problem solving, evaluation, practice and drill, and selection and graduation of arithmetical contents. This course is designed for teachers and supervisors in the elementary school. (July 1-July 17.) 11:00-12:20 Monday-Saturday and 2:00-4:00 Tuesday-Thursday. 3 s.h.
Petty Assisted by Sandefur

203. PRINCIPLES OF SCHOOL ADMINISTRATION.—The fundamental facts and procedures of school administration, an analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. 9:20-10:40. 3 s.h. Stumpf

204. THE SCHOOL AS AN INSTITUTION.—Consideration is given to the place of the school in the American social order, and its adaptation to the social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunity. 9:20-10:40. 3 s.h. Martin

211. THE PROBLEM CHILD (also Psychology 211).—Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 9:20-10:40. 3 s.h. Mrs. Gehman

217. THE PSYCHOLOGICAL PRINCIPLES OF EDUCATION.—An advanced study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 11:00-12:20. 3 s.h. Gehman

225. THE TEACHING OF HISTORY AND THE SOCIAL STUDIES.—Evaluation of the objectives, content, materials, and methods in the teaching of history and the social studies. 11:00-12:20. 3 s.h. Pittillo

232. SUPERVISION OF INSTRUCTION.—A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to community needs. 9:20-10:40. 3 s.h. Hurlburt

243. PERSONALITY DYNAMICS.—A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 9:20-10:40. 3 s.h. Gehman

246. THE TEACHING OF MATHEMATICS.—This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. (June 14-June 30.) 11:00-12:20, Monday through Saturday and 2:00-3:20, Monday through Friday. 3 s.h. Reynolds

253. SCHOOL LAW.—The primary purpose of this course is to familiarize school administrators and teachers with the legal features of school organization and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 7:40-9:00. 3 s.h. Bolmeier

266. SCIENCE IN THE ELEMENTARY SCHOOL.—Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equipment, and field studies. (June 21-July 17.) 7:40 daily plus 2:00-4:00 Monday, Wednesday, and Friday. 3 s.h. GITTENS

291. PUBLIC AND COMMUNITY RELATIONS OF SCHOOLS.—A study of the relationship between administrators, professional personnel, non-professional employees, and the entire school or school system and the several publics of the school, especially with those of the community of a given school. Media for interpreting needs and views of the school to the public and vice versa will be explored. The study will apply both to public and private schools. 11:00-12:20. 3 s.h. STUMPF

315. SEMINAR IN SECONDARY-SCHOOL TEACHING.—Advanced level consideration of principles, practices, and problems in secondary-school instruction. Designed particularly to accompany an internship. For students without previous internship credit, this course must be accompanied by Education 216.

315.1 7:40-9:00. 3 s.h. PITTILLO

315.2 7:40-9:00. 3 s.h. HURLBURT

SECOND TERM

213. ELEMENTARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the elementary-school staff. The scope of elementary education is considered to encompass nursery school, kindergarten, and the elementary school. Special treatment is given to the problems of internal organization and management of the elementary school, and its integration with the secondary-school level. 11:00-12:20. 3 s.h. SUBLETT

226. TEACHING READING IN THE ELEMENTARY SCHOOL.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. 9:20-10:40. 3 s.h. RUDISILL

234. SECONDARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 7:40-9:00. 3 s.h. BOLMEIER

235. THE NATURE, FUNCTION, AND REORGANIZATION OF THE CURRICULUM.—Selected problems guiding the reading of students. 9:20-10:40. 3 s.h. SUBLETT

237. LITERATURE FOR ADOLESCENTS.—This course offers a critical survey of literature written for, or appropriate for, junior and senior high-school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 7:40-9:00. 3 s.h. SHUMAN

238. REMEDIAL READING—PRINCIPLES AND PRACTICE.—A study of the basic causes of reading disability and of principles, methods, and materials for the diagnosis and correction of specific difficulties. The course provides practice with grade-school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during the six-week period. A basic course in the psychology of teaching of reading is prerequisite, or Education 226 may be taken concurrently. 11:00-12:20. 3 s.h. RUDISILL

239. METHODS AND PROBLEMS OF TEACHING ENGLISH IN SECONDARY SCHOOLS.—This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar and composition. Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles in the field. Several short compositions and a report will be required. 9:20-10:40. 3 s.h. SHUMAN

249. INTRODUCTION TO EXCEPTIONAL CHILDREN.—Survey course in special education covering the educational, psychological, medical and social aspects of exceptional children. Field experiences including emotionally disturbed, mentally retarded, neurologically impaired, physically handicapped, crippling and special health conditions, socially and culturally deprived and gifted children. (Opportunities for attendance at psychiatric, psychological, and educational demonstrations with exceptional children.) 7:40-9:00. 3 s.h. Stedman

258. EDUCATIONAL MEASUREMENTS.—A critical study of the principles and techniques involved in measurement in education, with opportunity for individual research. Prerequisite: twelve semester hours in the Department, including a course in educational psychology. 11:00-12:20. 3 s.h. Colver

276. THE TEACHING OF HIGH-SCHOOL SCIENCE.—Discussion, lectures and collateral reading, related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for secondary-school science. (July 19-August 14.) 7:40 daily plus 2:00-4:00 Monday, Wednesday, and Friday. 3 s.h. Githens

ENGINEERING

Professor J. L. Meriam, Dean of the College of Engineering—136 Engineering Building (West Campus); Professor Charles R. Vail, Associate Dean for Graduate Study and Research—130 Engineering Building (West Campus)

FIRST TERM

C.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydraulic engineering; materials science; structural engineering; or sanitary engineering. Thesis credit only. 6 s.h. Members of the Graduate Staff

C.E. 365. *ADVANCED TOPICS IN CIVIL ENGINEERING.—Opportunity for study of advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 s.h.
Members of the Graduate Staff

C.E. 399. *SPECIAL READINGS IN CIVIL ENGINEERING.—Special individual readings in a specific area of study in Civil Engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h. Members of the Graduate Staff

E.E. 265. *ADVANCED TOPICS IN ELECTRICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within the Electrical Engineering Department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. Members of the Graduate Staff

E.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under direction of a member of the staff in one of the following fields: dielectric materials; magnetic materials; energy conversion; instrumentation; high voltage phenomena. Master's thesis credit only. 6 s.h.
Members of the Graduate Staff

E.E. 399. *SPECIAL READINGS IN ELECTRICAL ENGINEERING.—Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h.
Members of the Graduate Staff

M.E. 265. *ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. Members of the Graduate Staff

* Offered only upon sufficient demand; enrollment limited.

M.E. 297, 298. THESIS RESEARCH.—A student with proper background may carry on research under the direction of the staff in one of the following fields: systems engineering; thermodynamics; heat transfer; and fluid flow. Thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

SECOND TERM

C.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydraulic engineering; materials science; structural engineering; or sanitary engineering. Thesis credit only. 6 s.h.
MEMBERS OF THE GRADUATE STAFF

C.E. 365. *ADVANCED TOPICS IN CIVIL ENGINEERING.—Opportunity for advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 s.h.
MEMBERS OF THE GRADUATE STAFF

C.E. 399. *SPECIAL READINGS IN CIVIL ENGINEERING.—Special individual readings in a specific area of study in Civil Engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h.
MEMBERS OF THE GRADUATE STAFF

E.E. 265. *ADVANCED TOPICS IN ELECTRICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within the Electrical Engineering Department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

E.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under direction of a member of the staff in one of the following fields: dielectric materials; magnetic materials; energy conversion; instrumentation; high voltage phenomena. Master's thesis credit only. 6 s.h.
MEMBERS OF THE GRADUATE STAFF

E.E. 399. *SPECIAL READINGS IN ELECTRICAL ENGINEERING.—Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h.
MEMBERS OF THE GRADUATE STAFF

M.E. 265. *ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

M.E. 297, 298. THESIS RESEARCH.—A student with proper background may carry on research under the direction of the staff in one of the following fields: systems engineering; thermodynamics; heat transfer; and fluid flow. Thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

ENGLISH

PROFESSOR LIONEL STEVENSON, CHAIRMAN—325 ALLEN BUILDING (WEST CAMPUS);
PROFESSOR HOLGER NYGARD, DIRECTOR OF GRADUATE STUDIES—321 ALLEN BUILDING (WEST CAMPUS)

Candidates for the Master's degree in English are expected to have had at least twelve semester hours in undergraduate courses above the sophomore level. The Department may also require additional courses if the work of the student in his first term indicates inadequate preparation.

FIRST TERM

55. REPRESENTATIVE BRITISH WRITERS.—Chaucer's Prologue to *The Canterbury Tales*, and at least two tales, Shakespeare's *I Henry IV*, *Hamlet*, or

* Offered only upon sufficient demand; enrollment limited.

King Lear, and one other play, John Donne's poetry (selections), and Milton's *Paradise Lost* (selections) and some of the shorter poems. 7:40-9:00. 3 s.h. FERGUSON

57. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works of Poe, Emerson or Thoreau, Hawthorne, Melville, Whitman, Emily Dickinson, and Mark Twain. 9:20-10:40. 3 s.h. DUFFEY

208. HISTORY OF THE ENGLISH LANGUAGE.—A survey of the language from Old to Present English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 11:00-12:20. 3 s.h. MCGALLIARD

219. THE EIGHTEENTH CENTURY.—Writers studied include Swift, Pope, Defoe, Addison, Steele. 9:20-10:40. 3 s.h. FERGUSON

221. ENGLISH LITERATURE OF THE EARLY NINETEENTH CENTURY. —The Romantic poets and prose writers, 1790-1810, with special attention to Wordsworth, Coleridge, and Scott. 7:40-9:00. 3 s.h. STEVENSON

224. ENGLISH LITERATURE OF THE LATER NINETEENTH CENTURY. —The later Victorian writers, with special attention to Ruskin, Arnold, the Pre-Raphaelites, Swinburne, George Eliot, Meredith, and Pater. 9:20-10:40. 3 s.h. STEVENSON

236. AMERICAN LITERATURE SINCE 1920.—Development of poetry in America from Ezra Pound to the present. 7:40-9:00. 3 s.h. DUFFEY

269. SOUTHERN LITERATURE.—The principal authors studied are Byrd, Kennedy, Simms, Poe, Timrod, and the humorists. Attention is given to the historical and cultural background and to literary relations extending outside the region. 11:00-12:20. 3 s.h. DAVIS

SUMMER INSTITUTE IN ENGLISH

During the first term the Department of English, in conjunction with the North Carolina State Department of Public Instruction, will conduct a Summer Institute for Teachers of English in the secondary schools. The courses in the Institute, listed below, are open to teachers selected for the Institute. For fuller information see page 30 of this *Bulletin*.

291. THE STUDY OF LITERATURE.—Analysis of the genres of literature and the application of the basic methods of critical study. Frequent assignments in writing. 11:00-12:20. 3 s.h. WILLIAMS

292. THE STUDY OF LANGUAGE.—A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; usage; and the application of language study to composition. 9:20-10:40. 3 s.h. MCGALLIARD

293. THE STUDY OF COMPOSITION.—Through frequent writing assignments and analyses of prose, the course aims at improving the student's writing ability and sharpening his critical judgment of secondary-school and professional writing. 7:40-9:00. 3 s.h. WILLIAMS

SECOND TERM

56. REPRESENTATIVE BRITISH WRITERS.—Novels by Fielding (*Joseph Andrews*), Dickens (*Great Expectations*), and Hardy (*The Mayor of Casterbridge*), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 7:40-9:00. 3 s.h. ANDERSON

58. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works of James, Frost or Robinson, Dreiser, O'Neill, Cummings, and Faulkner or Hemingway. 9:20-10:40. 3 s.h. ANDERSON

239. SHAKESPEARE.—The plays and poems. 9:20-10:40. 3 s.h. BRYANT

251. ENGLISH LITERATURE IN THE SEVENTEENTH CENTURY.—Major works in prose, poetry, and drama, 1600-1660. 7:40-9:00. 3 s.h. WARD

277. ENGLISH PROSE OF THE SIXTEENTH CENTURY.—The development of prose forms and styles from Caxton to Hooker and Bacon. 11:00-12:20. 3 s.h. BRYANT

342. STUDIES IN DRYDEN AND HIS AGE.—The early poems, the important odes, the religious and political poems, selected critical and controversial prose, the heroic play and tragedy. 11:00-12:20. 3 s.h. WARD

FORESTRY

PROFESSOR E. S. HARRAR, DEAN OF THE SCHOOL OF FORESTRY—213 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS); PROFESSOR J. G. YOHO, DIRECTOR OF GRADUATE STUDIES—104 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS)

Organized course work in the School of Forestry during the Summer Session is limited to forest surveying, dendrology, and forest mensuration. These courses are required of all students entering upon two years of study in technical forestry leading to the degree of Master of Forestry.

Qualified students may engage in thesis research in certain branches of forestry during the Summer Session with the approval of the instructor concerned and the Dean of the School of Forestry, or of the Director of Graduate Studies in the case of work taken through the Graduate School.

FIRST TERM

141. DENDROLOGY.—Nomenclature, classification, and identification of woody plants with special reference to species indigenous to southeastern United States and other important forest regions of temperate North America. Laboratory and field studies in the southern Appalachian Mountains, Piedmont Plateau and Atlantic Coastal Plain. Prerequisites: One year of biology including botany. (Three weeks, eight hours a day.) Instruction begins June 14, and continues through July 3. 3 s.h. WHITE

150. FOREST SURVEYING AND AERIAL PHOTO INTERPRETATION.—Application of plane surveying to forest problems, including use and adjustment of instruments; boundary, topographic and cover type surveys; details of land ownership, title, and transfer. Principles of aerial photogrammetry and interpretation of photographs for forest mapping and mensuration. Prerequisites: trigonometry; engineering graphics desirable. (Four weeks, eight hours a day.) Instruction begins July 5, and continues through July 31. 4 s.h. CHAIKEN

SECOND TERM

151. FOREST MENSURATION.—Field studies in methods of measuring content and growth of trees and forest stands; practice in timber estimating, log scaling, use of mensurational instruments, and collection of basic data. (Four weeks, eight hours a day.) Instruction begins on August 2 and continues through August 28. 4 s.h. OSBORNE

357. RESEARCH IN FORESTRY.—Open to students whose research programs for the M.F. or D.F. degree have been approved by the Dean of the School of Forestry and the instructor responsible for directing the research and whose programs for the A.M. or Ph.D. degree have been approved by the Director of Graduate Studies and the instructor in charge. (Credits and schedule to be arranged.) June 12-August 24. 2 to 12 s.h. (Not more than one semester hour of credit per week for full-time schedule or one semester hour each two weeks for half-time schedule.) (Consult courses 301-302 in Announcement of School of Forestry for letter designation of branches of forestry in which research is to be conducted.) STAFF

GEOLOGY

PROFESSOR L. WILLARD BERRY, CHAIRMAN—019 SCIENCE BUILDING (EAST CAMPUS)

The class in Geology, Term I, will begin on June 21 and continue through July 17. The class in Geology, Term II, will begin on July 20 and continue through August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* on page 20 of this *Bulletin*. (Geology classes will not meet on Saturdays.)

FIRST TERM

51. GENERAL GEOLOGY.—This course is designed to give a general view of the surface features of the earth, their origin, structure, and materials. Illustrative materials are studied in the laboratory. Excursions may be made to neighboring points where principles of the science are studied in the field. Lectures or recitations, 8:00-10:30 daily; laboratory, 1:00-4:00, Monday through Thursday, June 21-July 17. 4 s.h. Heron

SECOND TERM

52. GENERAL GEOLOGY.—This course is designed to give some knowledge of the chief events of the earth's history. Excursions may be made to suitable neighboring localities. Lectures or recitations, 8:00-10:30 daily; laboratory, 1:00-4:00, Monday through Thursday, July 20-August 17. 4 s.h. Heron

GERMAN

PROFESSOR HERMAN SALINGER, CHAIRMAN—104 LANGUAGES BUILDING (WEST CAMPUS)

The work in German 1, 2, 63, and 64 will be coordinated with listening and oral practice in the language laboratory which students in German classes will be privileged to attend.

FIRST TERM

1. ELEMENTARY GERMAN.—Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. 11:00-12:20; and on Tuesdays and Fridays, 2:00-3:20. 4 s.h. Willson

63. INTERMEDIATE GERMAN.—Grammar review and composition; reading of short stories, novels, and poems. Prerequisite: German 1-2, or two units of high-school German. 9:20-10:40. 3 s.h. Willson

64. INTERMEDIATE GERMAN.—Continuation of German 63. Prerequisite: German 63 which may be taken concurrently. 11:00-12:20. 3 s.h. Seymour

GRADUATE READING COURSE.—An intensive course in German to develop rapidly the ability to read technical German in several fields. For graduate students only. 9:20-10:40. No degree credit. Seymour

91. INTRODUCTION TO GERMAN LITERATURE.—A third-year course, toward completion of the language requirement. Readings from representative German authors. Prerequisite: German 64 or equivalent. 9:20-10:40. 2 s.h. Alt

92. INTRODUCTION TO GERMAN LITERATURE.—A continuation of the third-year course, which completes the language requirement. Readings from representative German authors. Prerequisite: German 91 which may be taken concurrently. 11:00-12:20. 2 s.h. Alt

SECOND TERM

2. ELEMENTARY GERMAN.—Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. Prerequisite: German 1 or equivalent. 11:00-12:20; and on Tuesdays and Fridays, 2:00-3:20. 4 s.h. Alt

HEALTH AND PHYSICAL EDUCATION

E. M. CAMERON, DIRECTOR, TRINITY COLLEGE AND COLLEGE OF ENGINEERING—109 GYMNASIUM (WEST CAMPUS)

FIRST TERM

PE 182. THE ADMINISTRATION OF HEALTH AND PHYSICAL EDUCATION IN SECONDARY SCHOOLS.—Presents the everyday problems that arise in the experience of the teacher of health and physical education. Open to juniors and seniors. 11:00-12:20. 3 s.h. Harrison

PE 190. PROTECTIVE PRACTICES IN PHYSICAL EDUCATION.—Training and conditioning of athletic teams and the prevention, diagnosis, and treatment of athletic injuries. Gymnasium. 7:40-9:00. 3 s.h. Chambers

HISTORY

PROFESSOR RICHARD L. WATSON, JR., CHAIRMAN—235 ALLEN BUILDING (WEST CAMPUS); PROFESSOR HAROLD T. PARKER, DIRECTOR OF GRADUATE STUDIES—232 ALLEN BUILDING (WEST CAMPUS)

For admission to candidacy for a Master's degree in History, the student must present a total of twelve semester hours of prior work in History, of which at least six must be in American History if he plans to take his major work in that field. Candidates for the degrees of Master of Arts and Master of Arts in Teaching are required to complete at least three hours of seminar work and are strongly urged to enroll for this work in the second term of their attendance in the Summer Session. (See courses numbered 300 or above.)

FIRST TERM

51. MODERN HISTORY, 1500-1851.—The central fact of the expansion of Europe underlies the content of the course. The chief themes are: the contest between liberty and authority in the modern state, changing economic theory and organization and the problems of peace and war among the states, including the Western infiltration of Asia, Latin America and Africa, and the rise of the United States as a world power. 7:40-9:00. 3 s.h. GINTER

91. THE DEVELOPMENT OF AMERICAN DEMOCRACY TO 1865.—This course is a study of trends vital to an understanding of the United States today. The main theme is the development of American democracy. Problems of foreign policy, the growth of capitalism, political practices, social behavior, and conflicting ideals are considered in relation to this main theme. 7:40-9:00. 3 s.h. MATHEWS

95. ANCIENT HISTORY.—An introductory study of the early history of mankind from preliterate man through the Fall of the Roman Empire. Among the topics considered are the prehistoric tribes, the early cultures of Mesopotamia and Egypt, the religious contribution of the Hebrews, and classical Greece and Rome. 9:20-10:40. 3 s.h. YOUNG

281. TWENTIETH-CENTURY EUROPEAN INTELLECTUAL HISTORY.—An analysis of the more significant aspects of twentieth-century European thought in their historical context. 7:40-9:00. 3 s.h. PFAFF

282. SOCIAL HISTORY OF THE UNITED STATES, 1789-1849.—A study of American society before the Civil War, with special attention to the background, motivation, and development of social criticism and reform. 9:20-10:40. 3 s.h. MATHEWS

295. RECENT INTERPRETATIONS OF ANCIENT AND MEDIEVAL HISTORY.—A course designed to encourage a critical evaluation of major issues and of recent scholarships in ancient and medieval history. 11:00-12:20. 3 s.h. YOUNG

301. SEMINAR IN HISTORICAL INVESTIGATION.—A course designed to introduce teachers, current and prospective, to the processes of historical research through investigation of particular instances. The topics selected for investigation vary with the needs and interests of each individual. 1:40-3:00 or at an hour to be arranged. 3 s.h. FERGUSON

SECOND TERM

52. MODERN HISTORY, 1851-1965.—A continuation of History 51. 7:40-9:00. 3 s.h. CELL

92. THE DEVELOPMENT OF AMERICAN DEMOCRACY, 1865 TO THE PRESENT.—The emphasis is on the emergence of contemporary problems. 7:40-9:00. 3 s.h. WALL

142. CHINA AND JAPAN IN THE TWENTIETH CENTURY.—The history of China and Japan since 1911; the growth of nationalism in China and militarism in Japan. Japan's invasion of China, and the rise to power of the Chinese Communists. 11:00-12:20. 3 s.h. GILLIN

250. SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES.—A history of American thought from 1865 to the present. 7:40-9:00. 3 s.h. MILLER

262. THE SOVIET UNION SINCE 1929.—An analysis of the history, politics, culture, and economy of the Soviet Union under Stalin and Khrushchev. 11:00-12:20. 3 s.h. Lerner

283. COMMUNISM IN MODERN CHINA.—The history of Chinese Communism, from the time of inception in 1919 through its triumph on the Chinese mainland in 1950. 9:20-10:40. 3 s.h. Gillin

302. SEMINAR IN HISTORICAL INVESTIGATION.—See description of 301. 1:40-3:00 or at an hour to be arranged. 3 s.h. Lerner

HOSPITAL ADMINISTRATION

SECOND TERM

201. HISTORY AND DEVELOPMENT OF HOSPITALS AND OTHER HEALTH AGENCIES.—This course is designed to give the student a broad concept of the health field. It includes a study of the evolution of health institutions; analysis of medical care organizations in the United States, and an introduction to the medical sciences and to medical terminology. 3 s.h. Smith

MATHEMATICS

PROFESSOR J. J. GERGEN, CHAIRMAN—134 PHYSICS BUILDING (WEST CAMPUS);
PROFESSOR J. H. ROBERTS, DIRECTOR OF GRADUATE STUDIES—
227 PHYSICS BUILDING (WEST CAMPUS)

Graduate students are invited to consult with the Director of Graduate Studies concerning their programs.

FIRST TERM

21. INTRODUCTORY CALCULUS.—Rectangular coordinates, functions, graphs, derivatives, maxima and minima, indefinite integrals, areas. Prerequisite: two and one-half units of college preparatory mathematics. 9:20-10:40. 3 s.h. Staff

64. INTERMEDIATE CALCULUS.—Infinite series, vectors, and solid analytic geometry, partial derivatives, multiple integrals, introduction to ordinary differential equations. Prerequisite: Mathematics 63. NOTE: This is a three-week course beginning June 14. 7:40-9:00 and 11:00-12:20. 3 s.h. Staff

221. DIGITAL COMPUTER.—History of computers; number representation, information storage, logical arithmetic; components and organization of computing systems; coding and programming; programmed arithmetics, function and functional subroutines, interpretive routines, compilers; error analysis. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. 11:00-12:20. 3 s.h. Smith

224. STATISTICS.—Elements of mathematical statistics, including a study of probability theory, empirical and theoretical distributions, correlation and regression, sampling, curve-fitting. 9:20-10:40. 3 s.h. Bryson

SECOND TERM

22. INTRODUCTORY CALCULUS.—Application of the definite integral to distance, volume, length, area of surface of revolution moments, centroids, integration. Prerequisite: Mathematics 21. 9:20-10:40. 3 s.h. Staff

MATHEMATICS AND SCIENCE INSTITUTE

Only persons who are regular participants in the Summer Science and Mathematics Institute are eligible for these courses, except by special permission from the Director of the Institute.

Botany 205. SURVEY OF MODERN BOTANY I. 3 units (graduate).

Zoology 205. ZOOLOGY FOR TEACHERS. 3 units (graduate).

Botany 235. INTRODUCTION TO FIELD BOTANY. 3 units (graduate).

Botany 236. FIELD BOTANY. 3 units (graduate).

Zoology 225. INTRODUCTION TO FIELD ZOOLOGY. 3 units (graduate).

Zoology 226. FIELD ZOOLOGY. 3 units (graduate).

Mathematics 11. ALGEBRA AND TRIGONOMETRY. 3 units (undergraduate).

Mathematics 21-22. INTRODUCTORY CALCULUS. 6 units (undergraduate).

Mathematics 63. INTERMEDIATE CALCULUS. 3 units (undergraduate).

Mathematics 213-214. MODERN ALGEBRA. 6 units (undergraduate).

Mathematics 216. INTERMEDIATE ANALYSIS. 3 units (undergraduate).

Chemistry 1. INORGANIC CHEMISTRY WITH MATHEMATICS REFRESHER. 3 units (non-credit).

Chemistry 211-212. CHEMISTRY FOR TEACHERS. 6 units (graduate).

Physics 231-232. PHYSICS FOR TEACHERS. 6 units (graduate).

MYCOLOGY

325. MEDICAL MYCOLOGY.—A lecture and laboratory course with emphasis on those fungi which cause disease in man and animals. The course includes practical laboratory work with materials from patients in Duke Hospital and those sent to the Duke Fungus Registry from outside sources. July 5-31. Lecture daily (Monday-Saturday), 8:00-9:00 a.m.; laboratory (Monday-Friday), 9:00-12:00 and 1:30-4:30 p.m.; Saturday 9:00-12:00. 4 s.h. CONANT

NURSING

These courses are open to nurses only, except by special permission from the Dean of the School of Nursing.

N120. PEDIATRIC NURSING.

N130. OBSTETRIC NURSING.

N140. MEDICAL NURSING

N150. SURGICAL NURSING.

N180. PUBLIC HEALTH SCIENCES.

PHILOSOPHY

PROFESSOR CHARLES A. BAYLIS, CHAIRMAN—212 WEST DUKE BUILDING (EAST CAMPUS); PROFESSOR PAUL WELSH, DIRECTOR OF GRADUATE STUDIES—212 WEST DUKE BUILDING (EAST CAMPUS)

FIRST TERM

41. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. 9:20-10:40. 3 s.h. SPECTOR

94. HISTORY OF PHILOSOPHY: ANCIENT AND MODERN.—An introduction to philosophy through the study of some of the major writings of the modern philosophers through Kant. (Open to Freshmen with a B average.) 11:00-12:20. 3 s.h. SPECTOR

SECOND TERM

42. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include the nature and ground of values, ultimate goals, and moral obligation. 9:20-10:40. 3 s.h. BINKLEY

93. HISTORY OF PHILOSOPHY: ANCIENT AND MODERN.—An introduction to philosophy through the study of some of the major writings of the ancient Greek philosophers. (Open to Freshmen with a B average.) 11:00-12:20. 3 s.h. BINKLEY

PHYSICS

PROFESSOR HENRY A. FAIRBANK, CHAIRMAN—119 PHYSICS BUILDING (WEST CAMPUS)

Classes in Physics 41, Term I, will begin on June 21 and continue through July 17. Classes in Physics 42, Term II, will begin on July 20 and continue through

August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* on page 20 of this *Bulletin*. (Physics classes will not meet on Saturdays.)

FIRST TERM

41. GENERAL PHYSICS.—This course treats the basic principles of general physics in a more quantitative manner than Physics 1-2. It meets in a thorough way the physics requirement for entrance into the study of either medicine or engineering, and is well suited for the general science student. This course is not open for credit for students who have completed Physics 1-2. Lecture and recitation daily, 8:30-9:50 and 10:10-11:30; laboratory four days per week, 1:00-4:00. Prerequisites: Mathematics 21, 22 or equivalent. 4 s.h. Hopkins and Carpenter

353X. THESIS SEMINAR.—Students who are properly qualified may carry on research work under direction. Credits and hours to be arranged. Staff

SECOND TERM

42. GENERAL PHYSICS.—A continuation of Physics 41. Prerequisite: Physics 41. Lecture and recitation daily, 8:30-9:50 and 10:10-11:30; laboratory four days per week, 1:00-4:00. 4 s.h. Hopkins and Carpenter

POLITICAL SCIENCE

Professor John H. Hallowell, chairman—307 Library (West Campus); Professor Allan P. Sindler, director of graduate studies—306 Library (West Campus); Professor Hugh M. Hall, director of undergraduate studies—315 Library (West Campus)

FIRST TERM

61. THE AMERICAN POLITICAL SYSTEM.—An analysis of the principles and institutions of government and politics in the United States. 11:00-12:20. 3 s.h. Simpson

125. AMERICAN POLITICAL PARTIES AND PRACTICAL POLITICS.—A study of the historical development, organization, and methods of political parties in the United States. 7:40-9:00. 3 s.h. Simpson

SECOND TERM

62. COMPARATIVE POLITICAL SYSTEMS.—An analysis of the principles and institutions of selected foreign governments, as compared with those of the United States. 11:00-12:20. 3 s.h. Williamson

229. RECENT AND CONTEMPORARY POLITICAL THEORY.—The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Christianity and the social order. 9:20-10:40. 3 s.h. Williamson

PSYCHOLOGY

Professor Irving L. Alexander, acting chairman—240 Building 9; Professor Norman Guttman, director of graduate studies—103 Building 9

Details concerning the program in studies in Psychology may be obtained from the Director of Graduate Studies in Psychology.

FIRST TERM

91. INTRODUCTORY PSYCHOLOGY.—An introduction to the facts, principles, and problems of psychology through a study of motivation, emotions, perception, sensation, thinking, memory, learning, social behavior, individual differences, and personality. 7:40-9:00. 3 s.h. Carson

211. THE PROBLEM CHILD (Also Education 211).—Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct

and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 9:20-10:40. 3 s.h. MRS. GEHMAN

232. PERSONALITY AND PHYSICAL HANDICAP.—Survey of the psychological factors underlying adjustment to physical disabilities, with particular stress upon personality, emotional and social attributes. Selected case studies will be used to illustrate the integration of such factors in adjusting to home, school, and hospital settings. These cases will stress the psychological factors which hinder learning and retraining procedures. Discussion will center about psychological techniques to produce more effective progress in rehabilitation. 7:40-9:00. 3 s.h. MRS. HUSE

303. RESEARCH.—Students who are properly qualified may carry on research work under direction. Hours and credit to be arranged. STAFF

SECOND TERM

100. PERSONALITY.—Representative theories of personality, from Freud to the present, emphasizing problems of normal personality structure, dynamics, development, and assessment. 9:20-10:40. 3 s.h. GREENWALD

304. RESEARCH.—Students who are properly qualified may carry on research work under direction. Hours and credit to be arranged. STAFF

RELIGION

PROFESSOR ROBERT E. CUSHMAN, DEAN OF THE DIVINITY SCHOOL—124 DIVINITY SCHOOL (WEST CAMPUS); PROFESSOR JAMES L. PRICE, CHAIRMAN OF THE DEPARTMENT OF RELIGION—117 DIVINITY (WEST CAMPUS); ASSISTANT PROFESSOR W. D. WHITE, DIRECTOR OF UNDERGRADUATE STUDIES IN RELIGION—117 DIVINITY (WEST CAMPUS); PROFESSOR WALDO BEACH, DIRECTOR OF GRADUATE STUDIES IN RELIGION—209 DIVINITY (WEST CAMPUS)

THE DEPARTMENT OF RELIGION

FIRST TERM

51. THE ENGLISH BIBLE.—A survey of the Old Testament, similar to Religion 1 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion 1. 7:40-9:00. 3 s.h. WINTERMUTE

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 9:20-10:40. 3 s.h. WINTERMUTE

85. INTRODUCTION TO CHRISTIAN ETHICS.—An analysis of the Biblical and theological bases for an understanding of man's moral situation, with a study of the social implications of Christianity in selected problem areas. Prerequisite: Religion 55 or equivalent. 11:00-12:20. 3 s.h. MCCOLLOUGH

140. CHRISTIAN BELIEFS.—An introductory study of important Christian teachings concerning God, Jesus Christ, sin and salvation, etc., intended to serve as a basis for the student's evaluation of his own religious concepts. 9:20-10:40. 3 s.h. LANGFORD

189. MAN IN MODERN PROPHETIC THOUGHT.—The individual and society in the writings of Kierkegaard, Nietzsche, and Berdyaev. 7:40-9:00. 3 s.h. MCCOLLOUGH

SECOND TERM

52. THE ENGLISH BIBLE.—A survey of the New Testament, similar to Religion 2 but adapted to the capabilities of sophomores, juniors, and seniors. Not

open to freshmen, or to students who have received credit for Religion 2. 7:40-9:00. 3 s.h. Phillips

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen or to students who have received credit for Religion 1-2 or 51-52. 7:40-9:00. 3 s.h. Partin

93. SURVEY OF THE WORLD'S LIVING RELIGIONS.—An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, the world's living religions are dealt with in terms of historical development and beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55 or equivalent. 9:20-10:40. 3 s.h. Partin

156. CHRISTIAN MARRIAGE AND THE FAMILY.—Marriage and the family in American society studied from the Christian perspective. Attention will be given to the teachings of the churches and of psychologists and sociologists concerning courtship and marriage, sex, parent-child relationships, mixed marriages, and divorce. 11:00-12:20. 3 s.h. Phillips

THE DIVINITY SCHOOL

Class enrollments will be controlled as occasion may arise so as to secure a fairly even distribution among the courses offered in each term.

FIRST TERM

115 (DS). MORAL THEOLOGY IN THE TWENTIETH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of William Temple and selected contemporary theologians. 11:00-12:20. 3 s.h. Harmon Smith

195 (DS). ORIGINS OF DOGMATIC THOUGHT.—An analysis of dogmatic concepts in the Gospel of John: their development into a body of doctrine. 7:40-9:00. 3 s.h. Herzog

261. THE THEOLOGY OF JOHN WESLEY.—A study of the development and structure of Wesley's theology, with special reference to his doctrines of man and salvation. 9:20-10:40. 3 s.h. Richey

SECOND TERM

16 (DS). CONTEMPORARY WESTERN CULTURE.—An analysis of the conceptual commitments in contemporary styles of thought and life as reflected in the natural sciences, philosophy, social analysis, and the arts. 9:20-10:40. 3 s.h. Poteat

140 (DS). THE RISE OF METHODISM AND THE ANGLICAN BACKGROUND.—The Methodist societies within the Church of England to the death of Wesley. Prerequisite: C.H. 13-14. 11:00-12:20. 3 s.h. Baker

170 (DS). INTRODUCTION TO PASTORAL COUNSELING.—The philosophy and techniques of formal counseling through discussions of textual and interview material. Prerequisite: P.C. 26. 7:40-9:00. 3 s.h. Goodling

ROMANCE LANGUAGES

PROFESSOR JOHN FEIN, CHAIRMAN—205 BUILDING 5

FRENCH

FIRST TERM

1. ELEMENTARY FRENCH.—Introduction to understanding, speaking, and writing French. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. Terry

63. INTERMEDIATE FRENCH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: French 1-2 or two years of high-school French. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. GOODE

SECOND TERM

2. ELEMENTARY FRENCH.—Continuation of 1. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. NAJAM

64. INTERMEDIATE FRENCH.—Continuation of 63. 9:20-10:40 and Tuesdays and Fridays 3:00-4:20. 4 s.h. NAJAM

210. FRENCH PHONETICS.—The phonemic structure of contemporary French. Sounds, intonation. Practice in transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied to French. 9:20-10:40. 3 s.h. HULL

242. FRENCH LITERATURE AND THOUGHT IN THE AGE OF ENLIGHTENMENT.—The new philosophy and its propagation. Lectures and discussions involving texts by Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and others. 11:00-12:20. 3 s.h. CHERPACK

SPANISH

FIRST TERM

1. ELEMENTARY SPANISH.—Introduction to understanding, speaking and writing Spanish. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. FLINT

63. INTERMEDIATE SPANISH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: Spanish 1-2 or two years of high-school Spanish. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. TORRÉ

SECOND TERM

2. ELEMENTARY SPANISH.—Continuation of 1. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. SIEBER

64. INTERMEDIATE SPANISH.—Continuation of 63. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. TER HORST

SOCIOLOGY AND ANTHROPOLOGY

PROFESSOR JOHN C. MCKINNEY, CHAIRMAN—268 BUILDING 9 (WEST CAMPUS);
PROFESSOR ALAN C. KERCKHOFF, DIRECTOR OF GRADUATE STUDIES—
268 BUILDING 9 (WEST CAMPUS)

The Department of Sociology offers graduate work leading to the A.M. and Ph.D. degrees. Before undertaking advanced work in this department, a student must have completed a minimum of twelve semester hours of approved preliminary courses in the field, and twelve additional semester hours in the field or in related work. A student who is deficient in the minimum required work will be asked to take additional undergraduate courses agreed upon in conference with the Director of Graduate Studies.

Candidates for advanced degrees in Sociology usually take minor work in Psychology, Economics, Political Science, Education, History, or Religion. Detailed requirements for the minor work, and for majors in other departments who wish to present Sociology as minor work, may be obtained from the Director of Graduate Studies.

FIRST TERM

91. INTRODUCTION TO SOCIOLOGY: CONCEPTS AND PROCEDURES.—Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. Open to freshmen. 11:00-12:20. 3 s.h. MRS. WHITRIDGE

CORRECTION

Description for French 242, FRENCH LITERATURE AND THOUGHT IN THE AGE OF ENLIGHTENMENT, should read "The crisis in literary aesthetics. Readings, lectures, and discussions bearing

154. THE SOCIOLOGY OF THE ARTS.—An analysis of the social relations of the world of the arts (painting and sculpture, music, and literature) with emphasis upon creative artists, art publics, art organizations and art works as they function in their social-cultural milieux. 9:20-10:40. 3 s.h. Mrs. Whitridge

247. COMMUNITY AND SOCIETY.—This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, news, mass behavior, social problems, races and classes. 9:20-10:40. 3 s.h. Thompson

255. RACE AND CULTURE.—A comparative study of race relations in world perspective developed around such themes as races and personal identity, the geography and ecology of race relations, the idea of race, and race conflict. 11:00-12:20. 3 s.h. Thompson

SECOND TERM

92. INTRODUCTION TO SOCIOLOGY: SOCIOLOGICAL STUDIES.—Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 11:00-12:20. 3 s.h. Roy

242. THE SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS.—The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 9:20-10:40. 3 s.h. Roy

ZOOLOGY

PROFESSOR EDWARD C. HORN, CHAIRMAN—227 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS); ASSOCIATE PROFESSOR D. A. LIVINGSTONE, DIRECTOR OF GRADUATE STUDIES—043 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS)

All classes in Zoology are offered at the Duke University Marine Laboratory at Beaufort, North Carolina (Term I, June 12-July 17; Term II, July 19-August 24). Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* page 20 of this *Bulletin*. For detailed instructions and further information on these offerings see the *Bulletin of Duke University Marine Laboratory*.

To undertake study toward an advanced degree in Zoology, a student should have completed an undergraduate major in Zoology or its equivalent. This normally amounts to twenty-four or more hours of course work distributed among various fields of Zoology. The department recognizes the trend in modern biology towards interdisciplinary research, and part of the Zoology requirements may be replaced by advanced work in Chemistry, Mathematics, Physics, etc.

Required work for the A.M. degree ordinarily includes twelve units of advanced course work in Zoology, six units of course work in a minor department, and an additional six units of advanced course work in the major or minor department, or in other pertinent departments. Furthermore, an acceptable thesis is necessary for the fulfillment of the degree requirements.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of Zoology, courses in the minor subject, wide reading in science in general and in biology in particular, research, and dissertation based on original work. Minor work is available in many fields, including Anatomy, Biochemistry, Botany, Chemistry, Physics, Physiology and Psychology.

FIRST TERM (Duke Campus)

353. RESEARCH.—Hours to be arranged. 2-6 s.h. Staff

FIRST TERM (Duke Marine Laboratory)

203. MARINE ECOLOGY.—A study of marine animals in relation to environment. Consideration of environmental factors, succession, rhythms, communities,

intraspecific and interspecific relations, productivity, conservation problems, etc., concerned with animal life in the ocean. Lectures, reviews, conferences, field and laboratory work. 6 s.h. GRAY

250. PHYSIOLOGICAL ECOLOGY OF MARINE ANIMALS.—A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla and from various habitats are studied. Prerequisite: Zoology 151 or equivalent. 6 s.h. ROBERTS

353. RESEARCH.—Hours to be arranged. 2-6 s.h. STAFF

SECOND TERM (Duke Campus)

353. RESEARCH.—Hours to be arranged. 2-6 s.h. STAFF

SECOND TERM (Duke Marine Laboratory)

215. GENERAL PHYSICAL AND CHEMICAL OCEANOGRAPHY.—Relief of the ocean floor; physical and chemical properties of sea water; distribution of temperature, salinity, and density; heat budget; sea ice; light; ocean currents, waves and tides; selected topics of regional oceanography. Field work, processing and analyzing of routine oceanographical data, solving problems and interpretation of results. Prerequisites: One year of physics and chemistry, mathematics through calculus. 6 s.h. STEFANSSON

274. MARINE INVERTEBRATE ZOOLOGY.—A study of invertebrate animals that occur in the Beaufort region. A number of field trips will be made to a variety of habitats to study, collect, and classify animals in their natural environment. The structure and habits of living invertebrates, as well as their behavior under certain experimental conditions, will be studied in the laboratory. 6 s.h. BARNES

353. RESEARCH.—Hours to be arranged. 2-6 s.h. STAFF

Application for room reservations and all correspondence concerning reservations should be addressed as appropriate to: Director of Housing, House D, Room 101-R, Duke Station, Durham, North Carolina, or Business Manager, Duke University Marine Laboratory, Beaufort, North Carolina.

Room rent is payable in advance. No deductions from grants, scholarships, etc., can be made to pay residence hall rents.

Room assignment will be made only upon the applicant's admission to the Summer Session, as certified by the Summer Session Office, and *upon payment of full room rent.* Applicants who expect to be in residence for longer than one term of the Summer Session are urged to make advance reservation for the entire period and thus avoid, to the extent that housing arrangements make it practicable, the necessity of moving from one room to another during the full term of residence.

See page 18 of Summer Session Bulletin for information concerning refund of fees.

When no single rooms are available, a person requesting a single room will be assigned a double room occupied by one person and charged room rent as stated below.

Requests for specific roommates will be complied with, provided completed application form of both applicants indicate mutual agreement and are on hand in the Housing Bureau at the time of room assignment. If the applicant requests a double room but gives no preference of roommate, the Director of Housing will try to assign a roommate of seemingly congenial interests. It is understood, however, that the responsibility for getting and keeping a roommate rests with the applicant; otherwise it will be necessary for him/her to move to a single room or to make the indicated financial adjustment.

RESIDENCE HALL ROOMS—RATES

SINGLE ROOM:		*DOUBLE ROOM:*	
5 weeks' term	$41.25	5 weeks' term $70.00	$35.00 per person
4 weeks' term	33.00	4 weeks' term 56.00	28.00 per person
3 weeks' term	24.75	3 weeks' term 42.00	21.00 per person
1 week's term	8.25	1 week's term 14.00	7.00 per person

Double room furnished as a single room and occupied by one person:

5 weeks' term	$56.25
4 weeks' term	45.00
3 weeks' term	33.75
1 week's term	11.25

PLEASE RETAIN THIS SHEET

DUKE UNIVERSITY
SUMMER SESSION APPLICATION FOR RESIDENCE HALL ROOM

PLEASE PRINT

Name..... Male ☐ Female ☐

Graduate ☐
Undergraduate ☐

Mailing Address.....

Permanent Address.....

.....

Present position..... City.....

Anticipated fields of study: (1)..... (2).....

Name of roommate preferred.....

Address..... Will you be writing a thesis? .....

Type of room desired: Single..... Double..... Double as Single.....

Number of weeks enrolled..... Date of arrival at Duke..... At Beaufort.....

Enclosed is check/money order payable to *Duke University* in amount of $.....
(Total payment required with application. No assignments will be made until full remittance is received.)

Mail completed application and check as appropriate to:

Director of Housing
Duke University, Duke Station
Durham, North Carolina 27706

Business Manager
Duke University Marine Laboratory
Beaufort, North Carolina

.....
Signature

DIRECTIONS TO SUMMER SESSION APPLICANTS

All applicants for Summer Session courses who are not now in residence at Duke University must fill out accurately and in detail the form below and return it to the Director of the Summer Session. Preference in enrollment will be given to persons returning the form promptly, but a place in a particular course cannot be assured until all fees are paid. Undergraduates or graduates who are enrolled in a university or college other than Duke University and who are seeking to transfer summer session credits to the college in which they are matriculated should request a course approval form to be certified by their dean or registrar. Persons applying for admission to the Graduate School of Duke University should write the Dean of the Graduate School for the necessary forms in addition to completing the form below.

.....

No. Approved Date.....

APPLICATION FOR ENROLLMENT IN THE DUKE UNIVERSITY SUMMER SESSION

Mr., Mrs., Miss.....

(Please Print)

Street Address, Rural Route, or P. O. Box.....

Post Office..... State.....

Nationality.....

Please register me in the following courses listed in the Summer Session *Bulletin*.

Department	No. of Course	Title of Course

Name and address of high school from which you graduated.....

.....

Have you attended a college? Yes..... No.....

Name and address of college.....

Highest degree held.....

Are you a candidate for a degree? Yes..... No.....

If yes, for which degree?.....

In what school or college of Duke University are you seeking to enroll (check one):

Undergraduate credits

- ☐ Trinity College (men)
- ☐ The Woman's College
- ☐ College of Engineering
- ☐ Special or unclassified
- ☐ Credits for transfer

Graduate credits

- ☐ Graduate School, Arts and Sciences
- ☐ Divinity School
- ☐ School of Forestry
- ☐ Special or unclassified
- ☐ Credits for transfer

Have you applied for admission to the Graduate School?.....

Are you at present a college student?..... If so, where?.....

..... What class?.....

Are you a full-time teacher?.....

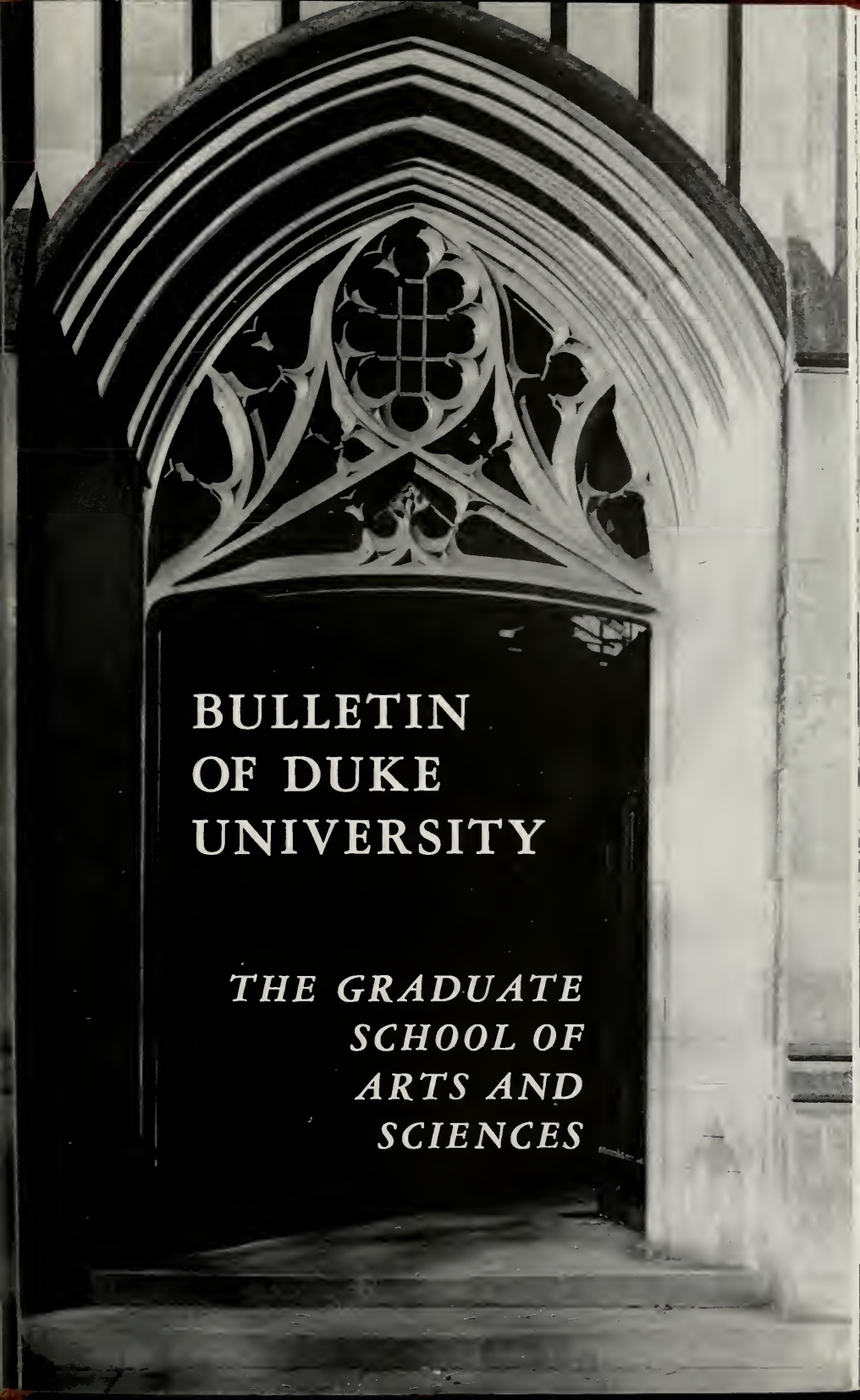
Name and address of school.....

Teaching position.....

Total number years teaching experience.....

Have you attended previous Summer Sessions at Duke: Yes.....

Years..... No.....



BULLETIN OF DUKE UNIVERSITY

THE GRADUATE SCHOOL OF ARTS AND SCIENCES

Graduate Education at Duke University

Bulletin of Duke University
The Graduate School of Arts and Sciences /
January 1965 / Vol. 37
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Durham, North Carolina

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To the Prospective Graduate Student at Duke University

In 1924 a new epoch in Southern higher education began: Trinity College in Durham, North Carolina, became Duke University as a result of the munificent bequest of Mr. James B. Duke. His action has been matched in educational history only by the similar bequests to the Johns Hopkins, Chicago, and Stanford Universities in the previous fifty years. In each of these cases, a university great by both national and international standards came into being.

In keeping with Mr. Duke's desire to emphasize the advanced training of men and women for scholarship and the learned professions, the graduate and professional schools were founded. In its first year, the Graduate School of Arts and Sciences enrolled eighty-six students and granted one Master of Arts degree. In the intervening thirty-six years, the Graduate School has awarded over 3,400 Master's and 1,100 Doctor's degrees. Today there is hardly a major university in the United States which does not have one or more Duke Ph.D.'s on its faculty, and many Duke alumni occupy college and university presidencies and other educational positions of leadership.

To the student in search of a superior graduate education Duke University has much to offer: an outstanding faculty, one of the finest research libraries in the nation, a campus unusual in its spaciousness and beauty. To this student the following pages are addressed; they are meant to provide him with information to help him make one of the crucial choices of his life, that of his future career.

R. L. Predmore
Dean of the Graduate School

Officers of the University Administration

Douglas Maitland Knight, *Ph.D., LL.D., Litt.D., President of the University*

Robert Taylor Cole, *Ph.D., Provost*

Gerhard Chester Henricksen, *M.A., C.P.A., Vice President for Business and Finance*
Treasurer

Everett Harold Hopkins, *M.A., LL.D., Vice President for Planning and Institutional Studies*
Assistant Provost

Frank Leon Ashmore, *A.B., Vice President for Institutional Advancement*

*Charles Edward Jordan, *A.B., LL.D., Vice President for University Relations*

Frank Traver de Vyver, *Ph.D., Vice Provost*

Harold Walter Lewis, *Ph.D., Vice Provost, Dean of Arts and Sciences*

Barnes Woodhall, *M.D., Vice Provost*

Benjamin Edward Powell, *Ph.D., Librarian*

Richard Lovejoy Tuthill, *Ed.D., University Registrar*

Craufurd Goodwin, *Ph.D., Secretary*

Edwin Constant Bryson, *LL.B., University Counsel*

* On leave 1964-65.

Graduate School Administration

Richard Lionel Predmore, *D.M.L., Dean of the Graduate School of Arts and Sciences*

Francis Ezra Bowman, *Ph.D., Secretary of the Graduate Faculty, Associate Dean and Director of Admissions, Graduate School of Arts and Sciences*

David V. Martin, *Ed.D., Assistant to the Dean*

Executive Committee of the Graduate Faculty

Kurt Back
Francis E. Bowman
Charles K. Bradsher
Richard L. Predmore
Robert S. Smith*
Lionel Stevenson*
Daniel C. Tosteson*
Paul Welsh

* Term ends September, 1965

Contents

Introduction 7

"Should I go to graduate school?" 7

"How should one choose a graduate school?" 9

"How long will it take?" 11

Financing graduate education 13

The Duke University Graduate School 17

Views of Duke Campus 20

General Regulations Governing Graduate Studies 29

Admission 29

Earning the Degrees 31

The Language Requirement 32

Other Requirements 33

Financial Regulations 34

Calendar of the Graduate School 35

Advanced Degree Programs at Duke (with an abbreviated list of course offerings 1965/66) 36

Introduction

Writing in the nineteen-twenties, the philosopher and man of science Alfred North Whitehead described the goal of higher education in these terms: "The task of a University is the creation of the future." It is less than ninety years since the founding of the first formally organized graduate school in the United States, but it has become most evident that graduate schools, through their training of teachers, researchers, industrial specialists, scientists, and government advisors, play one of the most vital roles in "the creation of the future."

Ideally, a graduate school is a community of scholars—apprentice, initiate, and master—engaged in imparting and extending the realm of man's knowledge in the arts and sciences. A select group of students is admitted each year to undergo the rigorous discipline of an advanced degree program, the successful among them to emerge as scholars of promise. To enter upon graduate education today is to accept a real challenge; but the decision should not be made lightly or casually. The work towards a doctorate involves several years of tireless effort and possible sacrifice, and the material rewards may be less certain or less bountiful than in some alternative occupation. Pursued with determination, however, graduate education may be the doorway to a stimulating, creative, and meaningful life —a life which few persons who have chosen it would exchange if they had the opportunity of reliving their student years.

The student who is contemplating this challenge usually has many questions in mind; the following pages are an attempt to answer some of them. Many of the comments are applicable to programs at any university for a variety of degrees, although emphasis is placed here on the A.M. and Ph.D. programs at Duke University.

"Should I go to graduate school?"

This frequent question can be answered only by the questioner himself. The decision to work towards an advanced degree must be a personal commitment born of a real willingness to devote oneself to many months or possibly years of hard intellectual work just at the age when one may be impatient for financial independence and

freedom from academic discipline. Graduate education requires all the energy, enthusiasm, and self-discipline at one's disposal; to enter upon it half-heartedly is almost a certain recipe for discouragement or failure.

An equally important requisite for success in graduate study is the possession of a keen and disciplined intellect. Of this it can only be said that "the proof of the pudding is in the eating." A good undergraduate record may or may not be adequate evidence of ability. Many a student with an excellent undergraduate record has been unsuccessful in graduate study, because his undergraduate training stressed an ability to marshal facts and to articulate these facts rather than real understanding and an analytical mind. On the other hand, many distinguished scholars had undistinguished undergraduate records. It may be of some comfort to remember that Einstein had difficulty in mastering simple mathematics (although one should be certain that he is another Einstein before using this fact as an easy excuse!). In gaining admission to a graduate school, one's undergraduate record is of course an important element, but usually some margin is left to allow for the student who develops a serious academic interest only at a late stage. The student himself is often better able to judge whether his grade record is a true gauge of his ability or represents an under-par performance.

If a student feels he has both the ability and a strong desire to accept the challenge, he should not let other obstacles weigh unduly in his decision. About two-thirds of current students enrolled in Ph.D. programs in American universities have sufficient financial support from university, industry, or foundation sources to meet the minimum costs, and most universities have loan provisions to help the student without adequate resources. Today about forty percent of graduate students are married, and a majority of students' wives work part or full time during their husband's period of residence. Indeed, many wives pursue an advanced program concurrently. In addition to the regular arts and sciences program, Duke for example has a program in secondary school teacher education, a Nursing School, a Physical Therapy program, and a Christian Education program in the Divinity School, which enroll many student wives. Thus during graduate study one need not take the vows of poverty and bachelorhood which were once the prerequisite of guild apprenticeship.

There is no certain way of knowing in advance whether one will be successful or happy in graduate school; in this regard it differs little from any other career path one may choose to follow. It is

quite likely, however, that if one has both the motivation and the ability and does not try it, there will be regrets in later years. Although this must be an individual choice, superior intellectual ability is a scarce human resource, and its encouragement and utilization are a national concern as well as a personal one.

"How should one choose a graduate school?"

More than one hundred and eighty universities today offer work leading to the Ph.D. degree. Among these are about sixty institutions which grant only two or three such degrees a year in all fields combined. At the other end of the scale are about forty universities which account for nearly seventy percent of all doctorates granted in this country. Duke University is among these latter, as are most of the major institutions which offer work of quality ranging across a breadth of academic disciplines. But even if one can narrow the field to about forty major institutions, how does one select among these and what factors should affect one's final choice? A few key factors are briefly discussed below.

Size—Size is not an infallible guide to the quality of a graduate school. There are a number of poor graduate schools of exceedingly large size, and a number of extremely good small ones. There are advantages, however, in attending a university which has attained a certain level of size, although it is difficult to provide a magic number to use as a yardstick. It is simpler to mention a few of the disadvantages of too many or too few students.

An extremely large graduate school—and there are a few today which have between three and six thousand enrolled—is a rather far cry from the ideal of a small number of superior students working closely in intellectual pursuits with a few esteemed scholars. Classes of fifty to a hundred students, inaccessibility of senior faculty, shortage of library materials and facilities, only a nodding acquaintance with fellow students—these are only a few of the possible drawbacks. A very able student may develop well even in such an atmosphere of mass production, but this situation is hardly the ideal.

An extremely small graduate school also has its disadvantages. Most of the classes are likely to be mixed undergraduate-graduate classes, a student is not surrounded by many other good students who will help to sharpen his powers and create an atmosphere conducive to learning, facilities are often very limited, and the faculty are often primarily undergraduate instructors. A university must be willing to commit a significant portion of its resources to develop a grad-

uate program of high quality, and this is often not the case in an extremely small graduate school.

More important than the size of the entire graduate school is the size of the particular departmental program one is interested in. An optimum doctoral program will have an enrollment of perhaps thirty to one hundred students, admitting fifteen to forty new students each year, and turning out perhaps three to ten Ph.D.'s per year. Information on enrollment or degrees conferred is usually available in university catalogues or government publications on higher education, and a prospective student may find it useful to compare enrollments in various institutions before choosing a school.

Duke University is firmly committed to programs of moderate size where the interest of the student is paramount. Total enrollment in the graduate school is about 1200 students; approximately three hundred and fifty new students are admitted each year from about twenty-five hundred applications. Only three departments (1964) have more than eighty students; twelve departments have enrollments that fall within the optimum range suggested in the preceding paragraph.

Quality—Not only do universities differ considerably in their reputation for quality, but there are marked differences among departments within any university. Harvard, for example, is a great university because it has many reputable departments, not because it is best in every category. On the contrary, many excellent universities have a few quite weak departments in which a student would fare less well than he might in an excellent department in a less esteemed institution. One should therefore not be guided solely by the reputation of a university as a whole, but inquire more specifically about the area in which one wishes to specialize.

Since judging the quality of a graduate program is necessarily subjective, no two people are likely to be in complete agreement. The prospective student would do well to talk with his professors in his undergraduate college, particularly those who have themselves achieved some reputation in the world of scholarship. As witnessed by their own continuing writing and research, they are more likely to have reliable information on the merits of various graduate programs. Similarly, the younger faculty member who is only four or five years out of graduate school may have more recent acquaintance with his and other schools. The relative position of a department may change markedly over the years, so that it is of little value to know the relative ranking, for example, of the Yale department of

Economics in the 1930's when one is concerned with the merits of its graduate program in the 1960's.

Certain other measures may be of some use in choosing a graduate school of quality, although they may not be perfect reflectors. The number of Woodrow Wilson Fellows enrolled in recent years is of possible interest in this regard. These fellowships permit the superior entering student to attend the graduate school of his choice, and thus provide a rough guide to the preferences of other good students. For the years 1958-1961 Duke ranked fourteenth in the country in the total number of Woodrow Wilson Fellows in attendance (fifth rank if one measures Woodrow Wilson Fellows as a percentage of total graduate enrollment). In 1963-64 seventeen enrolled.

Another yardstick to quality, albeit an imperfect one, may be the occasional questionnaires asking other educators to rank various graduate departments. In one of the most recent of such surveys, where department chairmen in many institutions were asked to rate graduate departments in a list of thirty major universities, Duke placed a number of its departments within the first fifteen in the country.

None of these guides is adequate in itself, but taken in conjunction with individual advice and recommendations they may help the student in his selection. An extremely good student can obtain a good graduate education in a number of universities, but in such an important choice it pays to be as well informed as possible.

The best procedure is to take many factors into account in choosing where to apply for admission, and then make application at the two or three schools one would most like to attend. (Applying at fifteen universities is merely a waste of an applicant's time and theirs.) It is wisest not to make a final selection solely on the basis of financial aid available, on the advice of a single friend or advisor, or on a university's past prestige. One should get as much current information as one can, write to the Graduate School or the departmental Director of Graduate Studies if further information is desired, visit the university in person if possible, and carefully weigh the advice of the more distinguished faculty members of one's undergraduate college.

"How long will it take?"

One of the primary questions in the mind of every student considering graduate study is "How long will it take?" This is not an

easy question, however, for the answer depends partly on the requirements of the student's program, partly on the student himself, and partly on the attitude in the graduate school and the department in which he is studying.

Degree requirements are usually stated quite unambiguously. For example, at most institutions, as at Duke, a typical Master of Arts program requires one academic year of residence for the fulfillment of course requirements, the passing of a language examination, and the completion of an acceptable thesis. This normally takes a minimum period of one calendar year. The Doctor of Philosophy program requires two years of course work, plus demonstration of proficiency in two languages and satisfactory completion of a dissertation embodying the results of original research. Three years is the usual minimum time required for the Ph.D.

The student's level of preparation before entering graduate school has a direct bearing on the speed with which he can progress towards a degree. One who enters with proficiency in one or more foreign languages and a good foundation in his chosen subject area may well be able to finish within the minimum time limits suggested above. On the other hand, the poorly prepared student may find that one and a half to two years are the minimum for the A.M., and four to five years for the Ph.D. (although wise use of the summers may reduce this time somewhat). The total time may also be lengthened if the student must work during part of his period of residence for financial reasons. (More on this subject below, under Financing Graduate Education.)

The attitude of the graduate school and its various departments will also affect the time needed to complete the degree. During the last decade the average time elapsing between entering graduate school and receiving the doctorate in American universities has been about seven years. A study of experience at Duke during the early 1950's indicated that the average doctorate in the humanities required a little over seven years, nearly six years in the social sciences, and slightly over four years in the sciences. Over the last few years, however, Duke University has been among the forerunners in striving to reduce the time needed to obtain the Ph.D. without any sacrifice in quality. This effort has taken the form of trying to eliminate the unnecessary delays, particularly those due to financial burdens on the student. Duke ranks among the leading institutions in the country today in terms of financial aid per student from university sources. Moreover, most of this aid is in the form of fellowships and scholar-

ships which do not require burdensome services in return. The large public institutions are often more restricted to awards which require substantial teaching, research, or other duties, thus reducing the speed with which a student can complete his resident course work. A student will be wise to inquire to what extent his progress towards a degree may be delayed by the work entailed in certain awards. If, for example, an assistantship lengthens unduly the time necessary to obtain a degree, even a smaller fellowship may be preferable.

Another way in which Duke encourages deliberate speed towards fulfilling degree requirements is through its tuition charges. Many graduate schools charge tuition for three full years in a doctoral program. In 1958 Duke adopted the policy of charging full tuition and fees only up to the time the doctoral student passes his "preliminary examination." (This examination is taken upon completion of all course requirements, normally at the end of the second year, before the student is formally admitted to candidacy for the Ph.D.) After "prelims," tuition charges are substantially reduced. In making his choice of a graduate school, a prospective student should inquire about the fees for a full doctoral program, not merely the charges for the first year. The new tuition and fee system at Duke has worked to encourage both the student and his department to arrange for preliminary examinations to be taken before the beginning of the third year. Five years ago fewer than half of the doctoral students at Duke took this examination before the beginning of the third year; today over ninety percent are doing so. This plan, aided by liberal scholarship and fellowship aid, gives the graduate student at Duke a marked advantage over his counterparts in many other graduate schools in acquiring his degree in the minimum amount of time.

How long it will take to obtain an advanced degree, therefore, depends on many factors, but the policy of the Graduate School is to keep the time to the minimum consistent with continuing quality in its graduate programs.

Financing graduate education

The typical entering graduate student, after completing his four-year undergraduate program, may not be able to continue with support from his family or from part-time earnings. All graduate schools, in order to minimize financial barriers for superior students, have at least modest funds at their disposal in the form of scholarships,

fellowships, or assistantships. Some few among the private universities have sufficient funds to aid more than half of their graduate students and often make total awards which are considerably greater than their entire tuition income from such students.

In 1962-63 at Duke sixty-six percent of all students (full-time and part-time) held an award of some type; twenty-nine percent were aided by Duke funds and thirty-seven percent by funds from other sources.

The student who seeks financial aid from the graduate school of his choice should be certain that he files his request for admission and award at a sufficiently early date. *Applications should be complete not later than February 15th* of the year in which September admission is sought. At Duke, the student's application, including transcripts of his previous college work and letters of recommendation, is then processed by the Graduate School and forwarded to the department in which he wishes to pursue advanced work. The graduate faculty—or admissions committee—in the department reviews all applications and then makes its recommendation to the Dean for announcement on April 1st. (In the case of graduate assistantships, these offers may be made prior to April 1.) The most outstanding applicants are then offered awards, the next in order of ranking are placed on an alternate list, and other students whom we should like to have attend but do not have sufficient funds to aid are given admission to the Graduate School. Because of multiple applications by students, a fraction of the awards offered by any graduate school are turned down by students who finally decide to go elsewhere. Alternates on the award list are immediately notified, and the process continues until the desired number of awards has been made.

The determining factors in the student's position in these rankings are the letters of recommendation, the undergraduate record, and (if required) pre-entrance test scores on the Graduate Record Examination, Miller Analogies Test, etc. Some capable applicants do not show up well according to these criteria, although they sometimes turn out to be excellent students after admission. Often part-time jobs, extra-curricular activities, lack of seriousness of purpose at an early age, or similar factors make a student's undergraduate record a poor gauge of his capabilities. The Graduate School, however, must judge as best it can from limited information, admittedly making occasional errors in judgment. Letters of recommendation usually weigh heavily in these judgments, particularly when the author

is a scholar held in high esteem by the faculty of the school to which application is made.

Entering graduate school for the first year without an award will not prejudice one's chances for a later award. In the spring of the first year, the graduate faculty reviews the progress of all current award holders, and weighs the applications of others. Awards for the second and third years are made almost entirely as a result of the student's record in the graduate program. Thus, it is often a wiser course in the long run to enter a good graduate school without an initial award than to go to a much poorer school with modest financial aid. A poor education is never a bargain when viewed in the perspective of a lifetime career!

Awards to entering students at Duke are of three different kinds.

1. *Fellowships* range from $2,000 to $3,400 for the academic year. They are divided into two categories, those from the annual awards budgets of the individual departments, and certain "name fellowships" from special funds or endowments. Foremost among the latter are the $3,400 James B. Duke Fellowships offered to outstanding students. Approximately thirty of these are offered to entering students each year in a competition that crosses departmental lines. Nominations are made by the individual departments from among the regular applicants for admission and award and are judged by a committee of the Graduate Faculty. Regular departmental fellowships usually range from $2,000 to $3,000, and are awarded upon recommendation by each department. Fellowship holders are expected to carry a full course load each semester.

2. *Scholarships* range from $600 to $1,800 for the academic year. Scholarship holders are also expected to carry a full course load each semester. Scholarships are awarded on recommendation by each department.

3. *Graduate Assistantships* range up to $3,200 for the academic year. Assistantships normally require services of the student up to twelve hours a week and permit the students to register for a four-fifths course load. Assistantships are most common in the science departments, where the student often provides laboratory assistance to various members of the faculty. Most graduate assistants remain in residence for at least one of the Summer Sessions during their first two years, carrying sufficient research or course credit so that they can complete their residence requirement of sixty units within two years. In this way, the normal progress towards a degree is not impeded by the reduced load during the fall and spring semesters.

Departmental research funds are often available to provide financial assistance during the summer.

In addition to the graduate awards from University funds, other fellowships are available from foundation, government, or industry sources. Among those at the University's disposal are fellowships in the Commonwealth-Studies Program, for students in Political Science, Economics and History concentrating their studies on the British Commonwealth; Kearns fellowships in Religion; Ford Foundation fellowships in economic development; Lilly Foundation fellowships in Political Science; C. W. Hargitt research fellowships in Zoology; and Cokesbury awards for preparation for college teaching. Duke University also offers fellowships under the National Science Foundation Co-operative Program, and in the first three years of the National Defense Education Act it was awarded fifty-two three-year fellowships in the fields of English, Political Science, History, Economics, Religion, Chemistry, and Anatomy-Physiology-Psychology. A number of other traineeships and assistantships are available in the sciences, Mathematics, and Psychology under grants from NASA, National Science Foundation, National Institutes of Health, and the United States Public Health Service.

Duke has been among the leading universities of its size in attracting Woodrow Wilson Fellows. These fellowships, awarded by a national competition which permits the student to attend the university of his choice, are available only for the first year of graduate study. Duke has also been among the leading universities in the percentage of Woodrow Wilson Fellows who continue their studies with fellowship aid beyond the first year.

Subvention funds, granted to universities attended by Woodrow Wilson Fellows, are used at Duke to provide additional fellowships for advanced students committed to teaching as a career. Fellowships of approximately $1,500, plus tuition, are awarded for work on the Ph.D. dissertation. From the same source a number of supplementary foreign travel grants for dissertation research are awarded each year, awards covering travel expenses up to $1,250. Since 1961 fellows have been in Australia, India, Cambodia, Spain, Ireland, England, France, Holland, and the Middle East.

Loan funds are also available for students who do not have sufficient financial resources at their disposal. Loans may be obtained either from the National Defense Act Loan fund or from University funds. These carry low interest charges and easy repayment terms. Further information may be obtained from the Graduate Office.

It is difficult to estimate a student's financial needs during the years of graduate study because of individual tastes and habits. One can predict with some accuracy, however, the three major items of expense at Duke: tuition and fees, $1200 for a full program for each of the first two years, normally $240 for the Ph.D. dissertation year; room rent, $250-325 each year in graduate dormitories; and board, approximately $500-550 in the graduate dining halls. Students holding awards are normally paid in eight equal installments beginning in October, and tuition and room fees are deducted monthly on a pro rata basis.

The costs of graduate education are high, but Duke University attempts to allocate its funds so that the superior student is able to finish his work for a degree in the normal length of time regardless of his personal financial resources. This is a contribution to the community of scholarship which the University is glad to bear.

The Duke University Graduate School

In surveying the progress made in the first seven years after the founding of Duke University, its first President, William Preston Few, wrote that he wanted "to see the Graduate School made strong because it will best and most quickly insure our attaining and maintaining a place of real leadership in the educational world . . . more than anything else here our Graduate School will determine the sort of University we are to build and its standing in the educational world." These opinions have continued to prevail to the present day, with emphasis upon the interdependence of teaching and research as the necessary components of scholarship.

Three hundred and twelve members of the graduate faculty teach the approximately five hundred courses and seminars offered in the Graduate School, and supervise thesis and dissertation research. Many of the major universities of the world have helped to train this faculty; approximately ninety percent of the graduate staff hold degrees from the forty-one institutions which make up the Association of Graduate Schools within the Association of American Universities. By place of birth they represent almost every state in the Union and almost two dozen foreign countries.

The twelve hundred graduate students currently enrolled represent a similar diversity in background. Approximately forty percent of students recently holding awards are from undergraduate colleges in the South, thirty percent are from the Northeast, twenty percent from the Midwest, eight percent from the Far West, and seven percent

from foreign countries. The old maxim that a university is only as good as its faculty might be amended by adding "and no better than its student body." No professor can *give* his wisdom to a student, and no student can *take* his understanding from another. This must be a reciprocal process between professor and student, and between student and student. The groundwork for learning may be laid in privacy—indeed a certain amount of private study and research is absolutely essential—but the vital stimulus to the learning process comes from one's contact with the minds of other men with similar or related interests. This is precisely why graduate schools are highly selective in their admissions policy, and one of the important reasons why they are willing to offer attractive fellowship awards to outstanding students. The superior student is a valuable catalyst both for his fellow students and for his faculty, and is prized as such.

Faculty and students comprise the essential human factors in education, but their joint endeavor cannot prosper without adequate research and library facilities. Duke University is particularly fortunate in regard to research facilities, for the physics, botany, zoology, psychology, engineering and biochemistry laboratories have been entirely built within the last sixteen years, and modernization and expansion have occurred in other scientific areas. It is also the University's pride that it has one of the finest research libraries, the sixteenth largest university library in the nation today. In number of volumes, breadth of coverage, serials, and documents, it is a much more adequate library than that available in many graduate schools with enrollment two or three times as large. To the student in the arts, humanities, and social sciences, for whom the library is the bloodstream of scholarship, this is an immeasurable asset.

Among the many special features of the Graduate School may be mentioned a few of importance to various graduate programs. For students in the biological sciences, the facilities of the Duke Marine Laboratory at Beaufort, North Carolina, are available for course work and research. The Laboratory has research buildings, class rooms, motor vessels, including the 118-foot oceanographic ship, the R/V *Eastward,* and living quarters which make it one of the best research centers in marine biology in the country. Closer to home are the seven thousand acres of the Duke Forest, managed by the School of Forestry, ideal for research on timber growth, soils and related topics. Students in both the physical and the life sciences frequently avail themselves of the facilities of the Oak Ridge Institute of Nuclear Studies, of which Duke is one of the sponsoring universities.

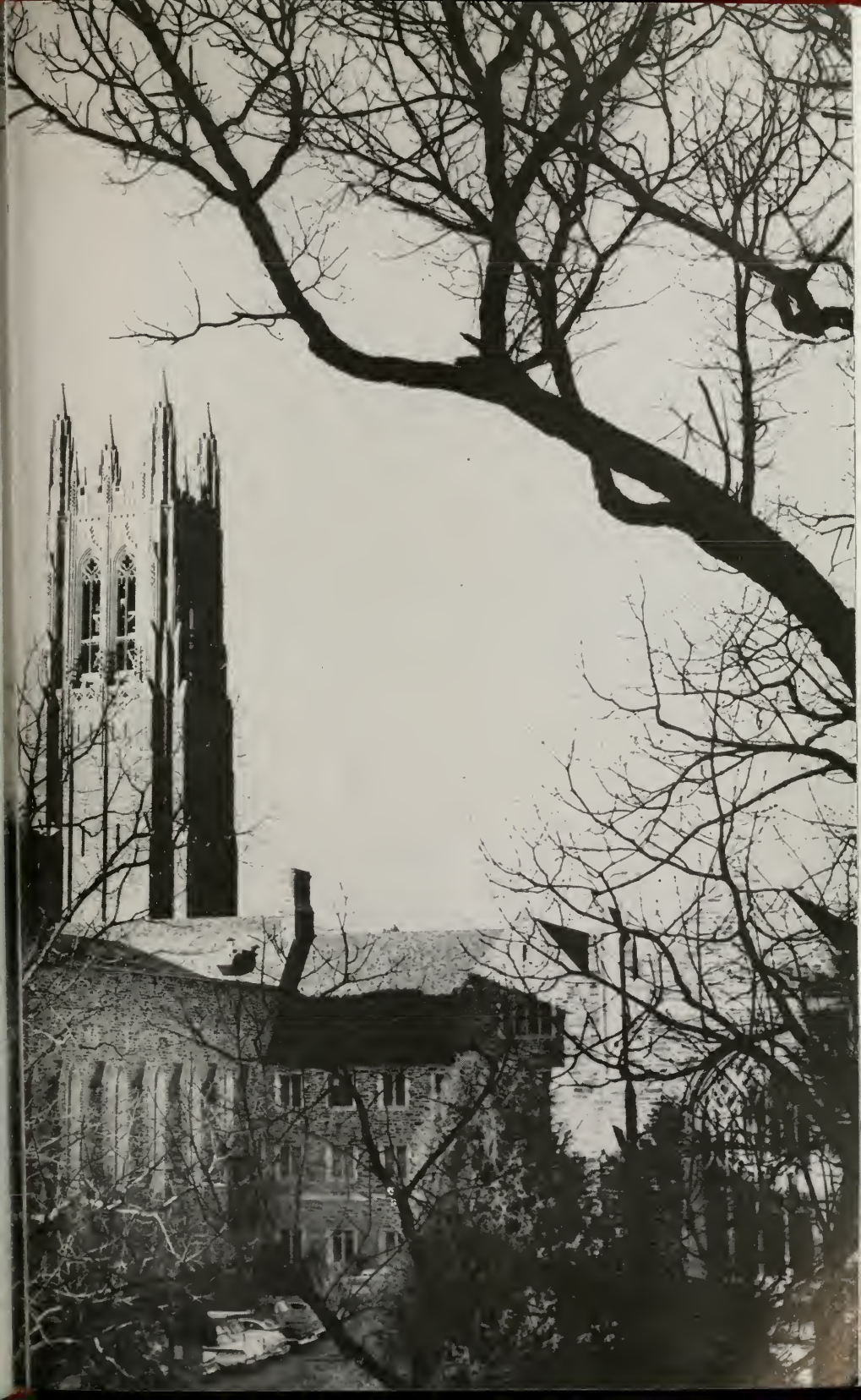
In the social sciences the Commonwealth-Studies Center is internationally recognized for its graduate training and research program. It is today one of the major centers, from the point of view of both faculty and library resources, carrying on studies of the various areas of the British Commonwealth. The Center is a cooperative enterprise of the Political Science, Economics, and History departments.

Other special teaching or research programs include the Lilly Endowment program in Christianity and the social order, jointly conducted by the departments of Political Science and Religion; the Ford Foundation-sponsored program in gerontology, conducted by the departments of Sociology and Economics; a joint program in the anatomical, physiological and psychological aspects of behavior with support under the National Defense Education Act; a research workshop on economic development for advanced students; and numerous others such as the Cooperative Programs with the University of North Carolina in the Humanities and in Slavic Studies. Duke is also fortunate in having excellent Medical, Law, Forestry, and Divinity Schools on its main campus, thus making many additional facilities available for course or research work related to the graduate curricula in the arts and sciences. A two-term Summer Session and the availability of courses in the nearby University of North Carolina under a cooperative arrangement offer other opportunities to the graduate student.

* * * * *

No description of programs can begin to give the prospective student the full flavor of graduate study in a particular institution. A visit to the universities one is particularly interested in may be helpful in giving one a better picture. If this should be practical, the Duke Graduate School offers a warm invitation to prospective students to come to the campus during the year to discuss their possible application and admission. The visitor will find at Duke most of the facilities that one could hope for in the largest of institutions, and yet the University has been fortunate in avoiding many of the evils inevitable with mass education. Despite the total University enrollment of approximately 6,700, Duke has retained the sense of community that one usually associates with a smaller liberal arts college. And in an age when current architectural whim often adds yet one more variant style to an already assorted array of buildings, Duke has built with foresight and design a campus of unusual beauty. This, too, is an important part of the fabric of education, creating an environment conducive to learning.

Pictorial representation of some of the facilities for graduate study at Duke University. . . . . .





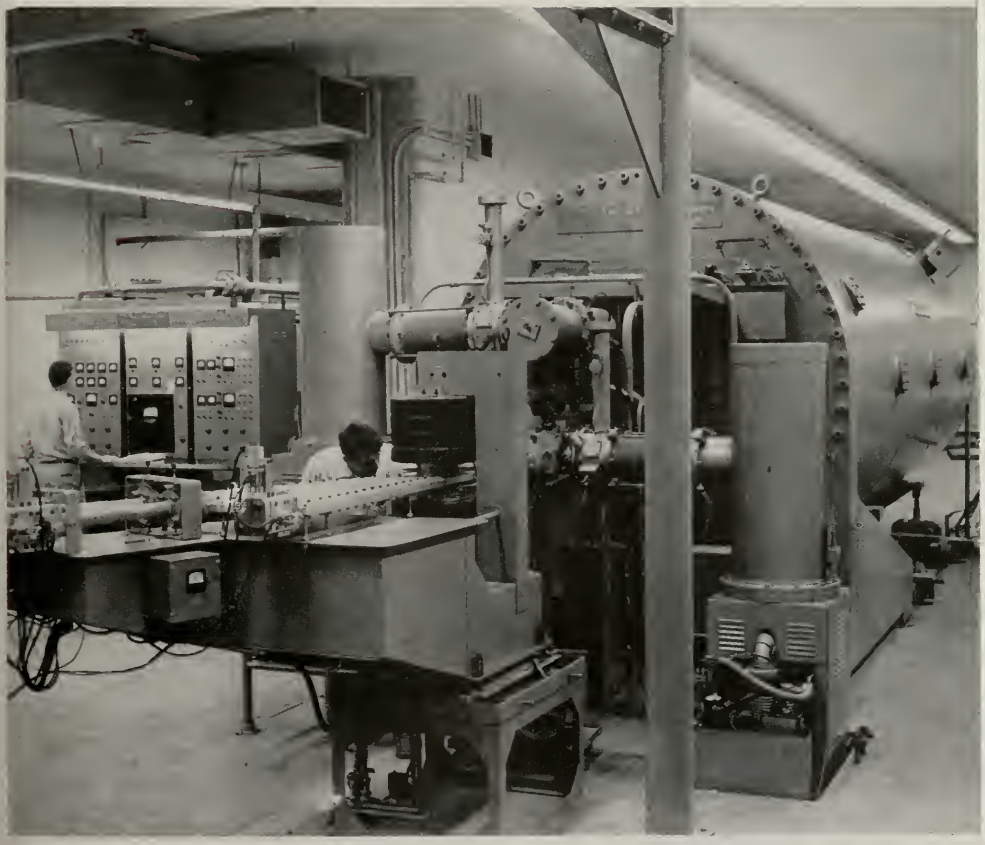
Library stacks, and carrels for assignment to students engaged in graduate study.



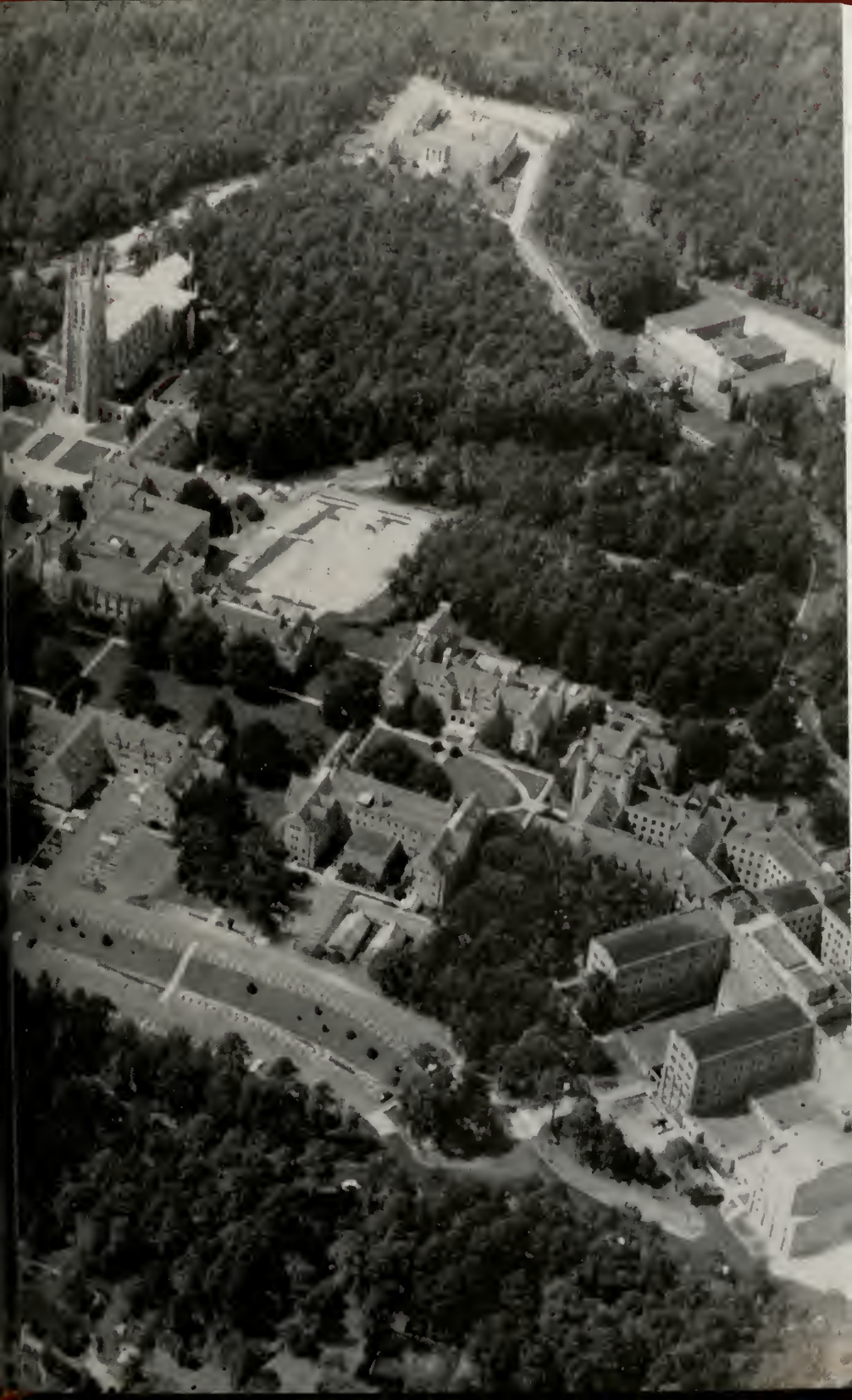
The Rare Book Room, which contains a number of notable collections and individual volumes.



A sterile chamber for research in the medical sciences.



A Van de Graaff accelerator for nuclear research.





Architect's drawing of the Biological Sciences Building (Botany, Forestry, and Zoology) now completed, fully occupied, but not yet landscaped.

The seminar in college teaching required of all doctoral students in History including NDEA Fellows.





Typical living room, partly furnished by the University, in the 224 apartments provided for married graduate students.



A corner of the spacious lounge in the Men's Graduate Center.



Seven-thousand acre Duke Forest, a vast laboratory for graduate study in forestry, botany, and zoology.

The 118-foot biological and oceanographic research vessel *Eastward* recently added to laboratories, classrooms, and residence facilities of the Duke University Marine Laboratory at Beaufort, N. C.



General Regulations Governing Graduate Studies

The official graduate School *Bulletin,* published in February of each year, gives a detailed account of regulations concerning graduate work at Duke University, and a full description of course content. The following pages are a summary of these materials for 1965-1966, and should provide sufficient information for the prospective student. The *Bulletin* is normally mailed to each student who is admitted to the Graduate School in the late Spring of the year of matriculation so that he may plan his course program for the first year. Copies may be obtained in February, however, by writing to the Graduate School Office, Dept. B., Duke University.

Admission

Admission is granted at any of the registration periods—September and February for the academic year, June and July for the Summer Session—but the student who plans study mainly in the academic year should enter in September when more courses are scheduled and year courses begin. Closing dates for accepting applications are approximately as follows (see the *Bulletin* for exact dates).

Fall Semester, Admission and Award	February 15
Fall Semester, Admission Only	August 1
Spring Semester	January 1
Summer Session, First Term	May 12
Summer Session, Second Term	June 18

Basic prerequisites for admission to a master's program are an A.B. or B.S. granted after four years' study in an accredited institution, approximately a B average in a well-rounded program, and a substantial major in the intended graduate field. The student seeking admission should 1) secure an application form from the Dean of the Graduate School, (one is bound into this bulletin) 2) complete and return it, 3) request that a transcript from any undergraduate or graduate institution attended be mailed promptly by the registrar

directly to the Dean of the Graduate School, 4) request that three letters of recommendation be sent to the Dean by persons able to estimate the applicant's capacity for successful graduate work.

As additional evidence of capability scores on the Graduate Record Examination, particularly the Aptitude Test, and on the Miller Analogies Test are strongly recommended in all departments and must be submitted if either test has been taken. Scores on the Graduate Record Examination may be requested of any applicant whose record is marginal and must be submitted by all applicants for a fellowship. Departments that require scores of all applicants are listed below:

	Graduate Record Examination *Aptitude Test*	*Advanced Test*	Miller Analogies Test
Anatomy	×	×	
Botany	×	×	
Economics	×	×	
English	×	×	
Forestry	×		
Germanic Languages	×		
History	×		
Philosophy	×		×[1]
Physiology	×		
Psychology	×		×
Romance Languages	×	×	
Zoology	×	×	×[1]

[1] Either GRE or MAT.

All applicants except foreign students applying from outside the United States must include an application fee of $5.00 in check or money order payable to Duke University.

An applicant who has already earned a master's degree should supply all the information outlined above including recent scores on the Graduate Record Examination and the Miller Analogies Test if these examinations have been taken.

When the application is complete and has been reviewed by the department and the Graduate School Office, a letter of notification will be sent to the applicant (notification will not be sent until April 1 for applications requesting a fellowship award, in keeping with an inter-university agreement). The process of admission is completed when the applicant has filled out and returned the acceptance form.

Admission may be of three types: *full,* without restriction; *provisional,* when some essential document is lacking or the record suggests the advisability of a trial period; *non-degree,* when the student desires transferable graduate credit for certification or for some other purpose but is not undertaking a degree program at Duke. Provisional status is reviewed when the deficiency has been corrected or

after the student has completed 15 units of course work in the academic year or 12 units in the Summer Session. If, on review, the record is found satisfactory, the status is altered to full admission with credit from the time of first registration.

Qualified *foreign students* are welcomed and can be accommodated in most departments. In addition to admission documents required of all applicants, the foreign student must provide 1) a statement by a qualified official that the applicant can read, write, speak, and understand English well enough to pursue a graduate program presented in English (unless he resides in an English-speaking country), 2) a statement certified by a responsible person that his finances are sufficient to maintain him during his stay at Duke University, 3) a statement by a qualified physician describing any emotional or physical illness the applicant has had during the previous five years. In meeting closing dates, foreign students should observe the time for mail to reach Durham.

Details of registration appear in the *Bulletin* and will be sent to all admitted applicants prior to the registration period. A normal full program includes four or five courses or seminars totaling 15 units per semester.

Transfer graduate credit may be accepted in a master's program up to 6 units but will not reduce the total fee-unit requirement here. An applicant for a doctoral program who has earned a master's degree may be granted transfer credit up to 30 units toward the required minimum of 60 units.

Earning the Degrees

Duke University offers graduate programs leading to the specified advanced degrees in the following fields:

Anatomy, A.M., Ph.D.
Biochemistry, A.M., Ph.D.
Botany, A.M., Ph.D.
Chemistry, A.M., Ph.D.
Civil Engineering, M.S., Ph.D.
Economics, A.M., Ph.D.
Education, M.Ed., M.A.T., A.M., Ed.D., Ph.D.
Electrical Engineering, M.S., Ph.D.
English, A.M., Ph.D.
Forestry*, A.M., Ph.D.
Geology, A.M.
Germanic Languages and Literature, A.M.
History, A.M., Ph.D.
Hospital Administration, M.H.A.
Mathematics, A.M., Ph.D.
Mechanical Engineering, M.S.
Microbiology and Immunology, A.M., Ph.D.

* In addition to the regular advanced degrees in the Graduate School of Arts and Sciences, the School of Forestry offers the professional degrees of Master of Forestry and Doctor of Forestry, and the Divinity School the degrees of Bachelor of Divinity, Master of Religious Education, and Master of Theology.

Philosophy, A.M., Ph.D.
Physics, A.M., Ph.D.
Physiology, A.M., Ph.D.
Political Science, A.M., Ph.D.
Psychology, A.M., Ph.D.
Religion*, A.M., Ph.D.
Romance Languages, A.M., Ph.D.
Sociology and Anthropology, A.M., Ph.D.
Zoology, A.M., Ph.D.

Programs leading to graduate degrees include course and seminar study prescribed by the individual departments; evidence of command of and training in the tools of research including foreign languages; guided and independent reading and laboratory and field experience; a period of residence with constant easy access to the library, laboratory, senior professors, and other graduate students; certain oral and written examinations to exhibit command of the declared field of study; and a thesis or dissertation as a public account of a body of knowledge the student has mastered. A final examination, generally focused upon the thesis or dissertation, enables the student to convince the graduate staff that he has fulfilled his intentions. Time limitations are set for completion of the program so that the initial ambition in undertaking graduate study and the momentum of accomplishment are not lost.

The Language Requirement

Before admission the student may need to know about the language requirements for which he should prepare. A requirement for the A.M. is command of one acceptable foreign language (French, German, Russian, and others if appropriate and approved) evidenced by an objective examination offered during the first registration period or by reading examinations at other scheduled times. (There is no language requirement for the M.Ed., M.A.T., M.H.A., or M.S. degrees). A requirement for the Ph.D. is command of *two* acceptable foreign languages. (There is no language requirement for the Ed.D. degree). Acceptable command will be shown by 1) the objective examination upon first registration, 2) in French, German, and Russian by scores on the E.T.S. tests in those languages offered at nationally set dates by the Duke Bureau of Testing and Guidance and other examining centers, 3) in Spanish and Italian by Departmental reading examination, 4) in other languages by special arrangements. Doctoral language requirements must have been met before the student is admitted to the preliminary examination.

Foreign students whose native language is not English, during their first registration period will be examined in their use of English, and those found deficient will be required to enroll in the

course entitled English for Foreign Students. Advanced-level non-credit reading courses in French and German are provided for students who need them.

Other Requirements

General requirements for a master's degree is a *minimum* of 30 units (semester hours) of course-seminar-research credit. If a thesis is presented (required for the A.M. and the M.S., optional for the M.Ed. and the M.A.T.) at least 24 units are allotted to course-seminar work and at least 6 units to thesis research. In the M.A.T. program practice teaching is included for students who lack it, and for them the total units required become a minimum of 36. A pattern of major and minor is prescribed for the course-seminar work, allotting half or more of the units to the major. For example, in the M.S. program (engineering only) up to half the units may be in appropriate fields outside of engineering (such as mathematics or the natural sciences); the M.Ed. allows at least half the units to fall within the student's teaching field, and the M.A.T. allows a major in either Education or teaching fields according to the student's previous training.

A master's program can be completed in one academic year, but the student who presents a thesis normally needs at least a calendar year, and foreign students should be prepared to study for two years. The maximum span of time permitted from first registration to completion of all requirements is six years.

Course-seminar-research requirements in the doctoral program are a *minimum* of 60 units, but the proportions of course-seminar work and research are generally flexible according to the student's needs. The applicant who has already earned the A.M. or M.S. (or for a degree in Religion, the B.D.) after establishing the quality of his work here, may be granted transfer credit to a *maximum* of 30 units (i.e. the equivalent of one year of residence). The dissertation is expected to be a mature and competent piece of writing, embodying the results of original and significant research. All dissertations will be published on microfilm, and the author may retain copyright privileges.

Fairly strict time limitations are set for completion of the doctoral program. The preliminary examination, which may be taken only after language and course-seminar requirements have been met, and which formally admits a student to candidacy for the degree, should normally be passed by the end of the second year and must be passed

by the end of the third. The interval between preliminary examination and presentation of an acceptable dissertation should normally be one to two years and may not be more than four years without special approval by the Dean. Should this interval grow beyond five years, a second preliminary examination becomes necessary.

The program for the Ed.D., with no language requirement, is distinctive in that in place of the usual dissertation the candidate, after a year of employment in an administrative or teaching position, may deal with a problem growing out of this experience.

Financial Regulations

Tuition and fees are charged at the rate of $40.00 per unit (a unit is roughly equivalent to a semester hour), with the normal full program of study being 30 units for an academic year. Upon successful completion of preliminary examinations and at least 60 units of course-seminar-research credits, the normal full program during the dissertation period is 3 units per semester while in residence, or 1 unit per semester while not in residence. The basic necessary expenses for a year of graduate study, assuming one lives in University graduate dormitories, are therefore approximately as follows:

	1st and 2nd Year	*Dissertation Year*
Tuition and Fees	$1200	$ 240
Room Rent	275	275
Board	550	550
	$2025	$1065

Additional allowance should be made for books, laundry, and other personal expenditures.

Information on fellowships, scholarships, assistantships and loan provisions is summarized in Part 1, above, pages 13-17.

Housing is provided for approximately 400 single men in the Men's Graduate Center, for 57 single women in Epworth Hall, and for 224 married couples in University apartments.

* * * * *

The applicant who wishes further information on facilities and regulations on course programs not covered in this booklet is invited to write to the Director of Admissions of the Graduate School, or the Director of Graduate Studies in the department of intended study.

Calendar of the Graduate School

Summer Session 1965

First Term—June 12—July 17
Second Term—June 19—August 24

Academic Year 1965-66

First Semester—September 22—January 28
Second Semester—February 3—June 6

Sept. 21	Registration for First Semester
Sept. 23	Classes Begin
Nov. 24-Nov. 29	Thanksgiving Recess
Dec. 18-Jan. 3	Christmas Recess
Jan. 28	End of First Semester
Feb. 2	Registration for Second Semester
Feb. 3	Classes Begin
March 26-April 4	Spring Recess
June 1	End of Second Semester
June 6	Commencement

Advanced Degree Programs at Duke

(For full course descriptions including credit and name of instructor see the complete *Bulletin*. Courses offered annually bear no date; those offered only when the demand warrants bear an asterisk.)

Anatomy

The Department of Anatomy offers graduate courses and training leading to the A.M. and Ph.D. degrees. Further information may be obtained from the Director of Graduate Studies of the department.

Professors

John Wendell Everett, *Ph.D.* (*Yale*); Duncan Charteris Hetherington, *M.D., Ph.D.* (*Illinois*); Joseph Eldridge Markee, *Ph.D.* (*Chicago*), *James B. Duke Professor of Anatomy, Chairman*; Talmadge Lee Peele, *M.D.* (*Duke*).

Associate Professors

Roland Frederick Becker, *Ph.D.* (*Northwestern*); Kenneth Lindsay Duke, *Ph.D.* (*Duke*), *Director of Graduate Studies*; Montrose J. Moses, *Ph.D.* (*Columbia*).

Courses of Instruction

M201. Anatomy as Related to Locomotion
M202. Microscopic Anatomy
M203. Anatomy of the Nervous System
M204. Neuroanatomical Basis of Behavior
M205. Anatomy of the Viscera
M301. Gross Human Anatomy
M312. Research
M313-314. Anatomy Seminar

Art

No graduate degree is offered in this department, but the following courses are suggested as possible minors for students majoring in history, literature, philosophy, religion, psychology, or sociology, or in any other interested departments.

Professors

Louise Hall, *Ph.D.* (*Radcliffe*); Ransom Rathbone Patrick, *Ph.D.* (*Princeton*); *Visiting Professor* Justus Bier, *Ph.D.* (*Zurich*).

Associate Professors

Sidney David Markman, *Ph.D.* (*Columbia*); Elizabeth Read Sunderland, *Ph.D.* (*Radcliffe*).

Courses of Instruction

215. Religious Art of the Ancient Near East*
216. Religious Art of the Classical World*
217. Aegean Art
218. Early Greek Art
221-222. History of Aesthetics (1965-66)
233. Early Mediaeval Architecture (Spring 1965)
234. Romanesque Sculpture*
239. Architecture of Great Britain
240. Architecture of North America
292. Research Problems in the Collections of the North Carolina Museum of Art (Spring 1965)

Biochemistry and Nutrition

Professors

Philip Handler, *Ph.D.* (*Illinois*), *Chairman*; Charles Tanford, *Ph.D.* (*Princeton*).

Associate Professors

William L. Byrne, *Ph.D.* (*Wisconsin*), *Director of Graduate Studies*; Mrs. Mary L. C. Bernheim, *Ph.D.* (*Cambridge*); Eugene A. Davidson, *Ph.D.* (*Columbia*); Walter R. Guild, *Ph.D.* (*Yale*); Robert Hill, *Ph.D.* (*Kansas*); Henry Kamin, *Ph.D.* (*Duke*); Kenneth McCarty, *Ph.D.* (*Columbia*); Ralph E. Thiers, *Ph.D.* (*London*); Salih Wakil, *Ph.D.* (*Washington*).

Assistant Professors

Irwin Fridovich, *Ph.D.* (*Duke*); Ronald C. Greene, *Ph.D.* (*California Institute of Technology*); Norman Kirshner, *Ph.D.* (*Pennsylvania State*); William Sanford Lynn, *M.D.* (*Columbia*); Theodore R. Rosett, *Ph.D.* (*London*); Robert W. Wheat, Ph.D. (*Washington University*).

Courses of Instruction

201. Introductory Biochemistry
203. Chemistry of Natural Products (Not 1965-66)
206. Laboratory Methods in Biochemistry
M241. General Biochemistry (for medical students)
301. Energy Metabolism
302. Nitrogen Metabolism
304. Proteins and Enzymes
314. Nucleic Acids and Genetic Mechanisms (Not 1965-66)
345-346. Seminar
348. Special Topics*
351. Nutrition*
354. Biochemistry of Disease*

Botany

Graduate work in the Department of Botany is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate study in botany a student should have had in his undergraduate program at least 12 semester hours of botany beyond an elementary course, and related work in biological sciences. Some work in chemistry and physics will be desirable and, for some phases of botanical study, a necessity. Graduate Record Examination scores are required of all applicants. The student's graduate program is planned to provide a broad basic training in the various fields of botany, plus intensive specialization in the field of the research problem.

Professors

Lewis Edward Anderson, *Ph.D.* (*Pennsylvania*); William Dwight Billings, *Ph.D.* (*Duke*), *Director of Graduate Studies*; Ellwood Scott Harrar, *Ph.D.* (*Syracuse*); Paul Jackson Kramer, *Ph.D.* (*Ohio State*), *James B. Duke Professor of Botany*; Aubrey Willard Naylor, *Ph.D.* (*Chicago*); Henry John Oosting, *Ph.D.* (*Minnesota*); Harold Sanford Perry, *Ph.D.* (*Cornell*).

Associate Professors

William L. Culberson, *Ph.D.* (*Wisconsin*); Harold J. Humm, *Ph.D.* (*Duke*); Terry W. Johnson, Jr., *Ph.D.* (*Michigan*), *Chairman*; Jane Philpott, *Ph.D.* (*State University of Iowa*); Robert L. Wilbur, *Ph.D.* (*Michigan*).

Assistant Professors

Donald E. Stone, *Ph.D.* (*California*); Richard A. White, *Ph.D.* (*Michigan*).

Courses of Instruction

203. Cytology
205. Anatomy
209. Lichenology
210. Bryology
212. Phycology
218. Comparative Morphology of Vascular Plants
221. Mycology
225-226. Special Problems
240. Plant Evolution
242. Systematics
245. Morphology
246. Ecology
251. Physiology
252. Plant Metabolism
254. Plant-Water Relations

255. Plant Systematics
256. Community Analysis and Classification
257. Principles of Plant Distribution
258. Physiology of Growth and Development
259. The Environment
305. Vegetation of North America
359-360. Research in Botany

Marine Laboratory

Three marine botany courses are given in the Duke University Marine Laboratory, Beaufort, N. C., one each summer in sequence: S205, Marine Microbiology (Not 1965); S207, Marine Mycology (Not 1965); S211, Marine Algae (1965); S220 Coastal Field Botany (1965).

Chemistry

In the Department of Chemistry graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking a graduate program in chemistry, a student should have taken an undergraduate major in chemistry along with related work in mathematics and physics.

Graduate courses in the department are designed to provide a broad basic training in the fields of inorganic, organic, analytical, and physical chemistry. An important requirement for the Ph.D. degree is the successful completion, under the direction of a member of the staff, of a research program leading to the solution of an original problem. The choice of the research program, for either the A.M. or the Ph.D. degree, will determine the field of advanced specialization.

Professors

Charles Kilgo Bradsher, *Ph.D.* (*Harvard*), *Director of Graduate Studies*; Frances Campbell Brown, *Ph.D.* (*Johns Hopkins*); Paul Magnus Gross, *Ph.D.* (*Columbia*), *William Howell Pegram Professor of Chemistry*; Charles Roy Hauser, *Ph.D.* (*Iowa*), *James B. Duke Professor of Chemistry*; Douglas Greenwood Hill, *Ph.D.* (*Princeton*); Marcus Edwin Hobbs, *Ph.D.* (*Duke*); William R. Krigbaum, *Ph.D.* (*Illinois*); John Henry Saylor, *Ph.D.* (*Duke*), *Chairman*; Howard Austin Strobel, *Ph.D.* (*Brown*); Pelham Wilder, Jr., *Ph.D.* (*Harvard*).

Associate Professors

Jacques C. Poirier, *Ph.D.* (*Chicago*); Louis Dubose Quin, *Ph.D.* (*North Carolina*); Peter Smith, *Ph.D.* (*Cambridge*).

Assistant Professors

Peter W. Jeffs, *Ph.D.* (*Natal*); Leon Lloyd Jones, *Ph.D.* (*Utah*); Eric Clifford Toren, *Ph.D.* (*Illinois*); Richard LeRoy Wells, *Ph.D.* (*Indiana*).

Adjunct Professors

Anton Peterlin, *Ph.D.* (*University of Berlin*); Vivian T. Stannett, *Ph.D.* (*Brooklyn Polytechnic Institute*).

Courses of Instruction

206. Elements of Theoretical Chemistry
215. Advanced Inorganic Chemistry
216. Nuclear Chemistry
234. Chemical Instrumentation
251. Qualitative Organic Analysis
252. Advanced Organic Preparations
253. Intermediate Organic Chemistry
261-262. Physical Chemistry
271. Introduction to Research
275-276. Research
303. Thermodynamics
304. Physical Chemistry of Reactions
306. Special Topics in Physical Chemistry
331, 332. Seminar in Analytical and Inorganic Chemistry
342. Advanced Organic Chemistry
350. Organic Reactions (Not 1965-66)
352. Mechanisms of Organic Reactions
353. Special Topics in Organic Chemistry
354. Stereochemistry

360. Polymer Chemistry
361. Advanced Polymer Chemistry
363, 364. Seminar in Physical Chemistry (Not 1965-66)
365, 366. Chemical Physics, Statistical Theory (365, Spring 1965-66; 366, Not 1965-66)
367, 368. Chemical Physics, Quantum Theory (367, Not 1965-66; 368, Fall 1965-66)
373, 374. Seminar

Classical Studies

Professors

Robert Samuel Rogers, *Ph.D.* (*Princeton*), *F.A.A.R. Chairman*; James Nardin Truesdale, *Ph.D.* (*Duke*); Berthold Louis Ullman, *Ph.D.* (*Chicago*), *Litt.D.* (*North Carolina*), William H. Willis, *Ph.D.* (*Yale*).

Greek

201-202. Greek Tragedy*
257. Social and Cultural History of the Hellenistic World from Alexander to Augustus

Latin

205-206. Mediaeval Latin*
211-212. Roman Oratory*
258. Social and Cultural History of the Graeco-Roman World

Comparative Literature

No graduate degree is offered in Comparative Literature. The following courses may serve in the minor programs of students in other departments. Consult Professor Salinger, Chairman of the Department of Germanic Languages and Literature.

201, 202. Romanticism (Not 1965-66)
203, 204. Realism and Symbolism (Not 1965-66)
205. Foundation of Twentieth-Century European Literature (Not 1965-66) (See also Germanic Languages and Literature 206. Middle High German: The Arthurian Romance in Germany)

Economics

The Department of Economics offers graduate work leading to the A.M. and Ph.D. degrees. A student entering graduate work in economics should have completed with satisfactory grades at least 12 semester hours of graduate work in economics, including 6 hours of Principles of Economics. Among the undergraduate courses of distinct advantage to the graduate student in economics are General Accounting, Elementary Statistics, Intermediate Economic Theory, Money and Banking, International Trade, and basic courses in philosophy, psychology, mathematics, and social sciences other than economics.

Requirements for the Ph.D. in economics include a core of courses in Mathematical Economics, Statistical Methods, Micro- and Macro-economic Theory, Economic History, and the History of Economic Thought. Economic Growth and Demography, Money and Banking, International Trade, Economic Systems, Labor Economics, Public Finance, and Industrial Organization are optional fields, of which the student elects at least three in preparation for the preliminary doctoral examination. Course requirements for the Ph.D., including a minor field, may be completed in four semesters of residence.

Professors

Martin Lee Black, Jr., *C.P.A., M.B.A.* (*Northwestern*); Frank Traver de Vyver, *Ph.D.* (*Princeton*); Charles Elmo Ferguson, *Ph.D.* (*North Carolina*); Frank

Allan Hanna, *Ph.D.* (*Wisconsin*); Calvin Bryce Hoover, *Ph.D.* (*Wisconsin*), *Litt.D., James B. Duke Professor of Economics*; Charles Earl Landon, *Ph.D.*, (*Illinois*); John Seneca McGee, *Ph.D.* (*Vanderbilt*); Robert Sidney Smith, *Ph.D.* (*Duke*), *Chairman*; Joseph John Spengler, *Ph.D.* (*Ohio State*), *James B. Duke Professor of Economics, Acting Director of Graduate Studies.*

Visiting Professors

James C. Ingram, *Ph.D.* (*Cornell*), and Clifton H. Kreps, Jr., *Ph.D.* (*Duke*).

Associate Professors

John O. Blackburn, *Ph.D.* (*University of Florida*); David G. Davies, *Ph.D.* (*University of California, Los Angeles*); Hans W. Gerhard, *Dr. rer. pol.* (*Tübingen*); Craufurd D. W. Goodwin, *Ph.D.* (*Duke*).

Assistant Professors

Louis De Alessi, *Ph.D.* (*University of California, Los Angeles*); Thomas H. Naylor, *Ph.D.* (*Tulane*); William H. Wallace, *Ph.D.* (*Illinois*).

Courses of Instruction

233. State and Local Finance
237-238. Statistical Methods
244. Econometrics
262. Trade Unionism and Collective Bargaining
275-276. Advanced Industrial Accounting and Management
301. Economic Analysis
304, 305. Seminar—Money and Banking
307, 308. Quantitative Analysis
311, 312. History of Political Economy
313, 314. Seminar—Economic Theory
315. Seminar—Economic Systems
316. Seminar—Economic Functions of the State
317. Seminar—Demographic, Population and Resource Problems
319. Seminar—Theory and Problems of Economic Growth and Change
320. Seminar—Trade Cycles, Employment, and Income Theory
329. Federal Finance
330. Seminar—Public Finance
331. Seminar—Economic History
340. National Income
355. Seminar—Labor Economics
358. Seminar—Labor Market and Related Analysis
365. Seminar—International Economics
366. Seminar—Problems in International Trade and Finance
386. Seminar—Latin-American Economic Problems
388. Seminar—Industrial Organization
389. Seminar—Industrial and Governmental Problems
401. Seminar—British Commonwealth

Education

Graduate work in Education is offered leading to the A.M., the M.Ed., the M.A.T., and the Ed.D. degrees. For each of these degrees there are specific requirements and prerequisites, all of which may be found stated in detail in the *Bulletin.* Departmental requirements and prerequisites for all of these degrees may be obtained from the Director of Graduate Studies.

From the courses listed below, plus several in related disciplines, a selection may be made which will meet North Carolina requirements for the advanced Principal's Certificate and the Superintendent's Certificate. (Some courses below are offered only in the Summer Session; see the Summer Session *Bulletin.*)

Accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's degree as the highest degree approved.

Professors

Edward Claude Bolmeier, *Ph.D.* (*Chicago*), *Director of Graduate Studies*; Francis E. Bowman, *Ph.D.* (*Harvard*); William H. Cartwright, *Ph.D.* (*Minnesota*), *Chairman*; Sherwood Githens, Jr., *Ph.D.* (*North Carolina*); Everett H. Hopkins, *M.A., LL.D.*, (*Wittenberg*); Allan S. Hurlburt, *Ph.D.* (*Cornell*); Wippert A. Stumpf, *Ph.D.* (*Chicago.*)

Associate Professors

Robert Merle Colver, *Ed.D.* (*Kansas*); W. Scott Gehman, Jr., *Ph.D.* (*Pennsylvania State*); Olan Lee Petty, *Ph.D.* (*Iowa*); Mabel F. Rudisill, *Ph.D.* (*Wisconsin*); R. Baird Shuman, *Ph.D.* (*Pennsylvania*); Henry L. Sublett, *Ed.D.* (*Virginia*); Henry Weitz, *Ed.D.* (*Rutgers*).

Assistant Professor

David V. Martin, *Ed.D.* (*Duke*).

Courses of Instruction

201. Teaching and Supervision of Arithmetic
203. Principles of School Administration
204. The School as an Institution
205. Curriculum Problems in Secondary Education*
210. Introduction to Educational Research
211. The Problem Child (also listed as Psychology 211)
213. Elementary School Organization and Administration*
215. Secondary Education: Principles
216. Secondary Education: Internship
217. The Psychological Principles of Education
222. The Curriculum and Materials of the Elementary Grades*
224. Teaching the Social Studies in Elementary Schools
225. The Teaching of History and the Social Studies
226. Teaching Reading in the Elementary School
228. Improvement of Instruction in the Social Studies
232. Supervision of Instruction*
234. Secondary School Organization and Administration
235. The Nature, Function, and Reorganization of the Curriculum
236. Teaching Reading in the Secondary School
237. Literature for Adolescents
238. Remedial Reading—Principles and Practice
239. Methods and Problems of Teaching English in Secondary Schools
240. Educational and Occupational Information*
241. Principles of Guidance
242. Measurement of Aptitudes, Interest, and Achievement
243. Personality Dynamics
244. Counseling Techniques
246. The Teaching of Mathematics
248. Practicum in Counseling
249. Introduction to Exceptional Children
250. Teaching Emotionally Disturbed Children: Internship
252. The School in the Legal Structure
253. School Law
258. Educational Measurements
266. Science in the Elementary School*
276. The Teaching of High School Science
285. Audio-Visual Aids in Education*
290. Administration of School Property*
291. Public and Community Relation of Schools*
315. Seminar—Secondary School Teaching
323. Public School Finance*
333. Seminar in Higher Education*
335-336. Seminar in School Administration
350, 351. Directed Activities in School Administration
354. Seminar in School Law*

Engineering

James Lathrop Meriam, Ph.D., Dean

Charles Rowe Vail, Ph.D., Associate Dean for Graduate Study and Research

The College of Engineering offers programs of study and research leading to the degrees of Master of Science with a major in civil, electrical, or mechanical engineering and Doctor of Philosophy with a major in civil or electrical engineering. These programs are designed to provide a fundamental understanding of the science of engineering, which is based on mathematics and the physical sciences, as well as a basic understanding of the art of engineering, which depends on human imagination and judgment.

A *minimum* of 30 units of earned graduate credit beyond the Bachelor's

degree is required for the M.S. degree: 12 in engineering, 6 in related minor work (normally mathematics or natural science), 6 in either the major or minor subject or in other areas approved by the major department and the Dean of the College of Engineering, and 6 for a research-based thesis. There is no language requirement for this degree.

A *minimum* of 60 units of earned graduate credit beyond the Bachelor's degree is required for the Ph.D. degree: 24 in engineering, 12 in related minor work (normally mathematics or natural science), 12 in either the major or minor subject or other areas approved by the major department and the Dean of the College of Engineering, and 12 for a research-based dissertation. In addition, a reading knowledge of two foreign languages which are relevant to the field of the dissertation is required (normally two of the following: French, German, or Russian).

Civil Engineering

A student may specialize in one of the following fields of study for either the M.S. or the Ph.D. degree: engineering mechanics, hydraulic engineering, materials science, sanitary engineering, soil and foundation engineering, or structural engineering. Appropriate combinations of these fields are also encouraged. Each graduate student participates in seminars appropriate to his field of study.

Under the Reciprocal Agreement with the Consolidated University of North Carolina, a student may include as a portion of the minimum requirements work offered by the Department of Environmental Science and Engineering of the University of North Carolina. Although minor work normally is taken in the natural sciences or mathematics, a student whose major interest relates to the social sciences may take relevant minor work in this area.

A minimum prerequisite to the graduate program in civil engineering is a basic knowledge of mathematics through linear differential equations, materials science, solid mechanics, and fluid mechanics.

Professors

Earl I. Brown, II, *Ph.D.* (*Texas*), *J. A. Jones Professor of Civil Engineering, Chairman, Director of Graduate Studies*; Edward H. Bryan, *Ph.D.* (*Wisconsin*); James Lathrop Meriam, *Ph.D.* (*Yale*); Aleksandar Sedmak Vesic, *D.Sc.* (*Belgrade*).

Visiting Associate Professor

Sudhir Kumar, *Ph.D.* (*Pennsylvania State*).

Assistant Professors

Furman W. Barton, *Ph.D.* (*Illinois*); Paul Harrawood, *M.S.* (*Missouri School of Mines*); David W. Hill, *Ph.D.* (*Stanford*); Don J. Wood, *Ph.D.* (*Carnegie Institute of Technology*).

Courses of Instruction

CE 201. Advanced Mechanics of Materials
CE 202. Experimental Stress Analysis
CE 205. Applied Elasticity
CE 211. Mechanical Behavior of Materials
CE 212. Structural Materials
CE 221. Incompressible Fluid Flow
CE 231. Structural Engineering
CE 232. Reinforced Concrete Design
CE 235. Foundation Engineering
CE 243, 244. Sanitary Engineering Unit Operations and Process Design
CE 250. Engineering Analysis
CE 297, 298 Thesis Research
CE 302. Theory of Plates and Shells
CE 321. Mechanics of Ideal Fluids
CE 322. Mechanics of Viscous Fluids
CE 331, 332. Advanced Structural Design and Analysis

CE 335. Mechanical Behavior of Soils
CE 336. Advanced Soil Mechanics
CE 365. Advanced Topics in Civil Engineering
CE 399. Special Readings in Civil Engineering

Electrical Engineering

A student may specialize in any one of the following fields in working toward either the M.S. or the Ph.D. degree: solid-state materials and devices; ferromagnetics; superconducting circuits; instrumentation; electronics; microwaves; computers and automatic control; energy conversion; and information processing. Graduate level physics courses in the area of microwaves may be used to satisfy either major or minor course requirements in electrical engineering.

A minimum prerequisite to the graduate courses in electrical engineering is a basic knowledge of differential equations, electrical and magnetic field theory, and the theory of networks. A previous course in modern physics is recommended.

Professors

Otto Meier, Jr., *Ph.D.* (*Pennsylvania*); Harry Ashton Owen, Jr., *Ph.D.* (*North Carolina State*), *Director of Graduate Studies*; Charles Rowe Vail, *Ph.D.* (*Michigan*); Thomas George Wilson, *Sc.D.* (*Harvard*), *Chairman.*

Associate Professor

John Leslie Artley, *D.Eng.* (*Johns Hopkins*).

Adjunct Associate Professor

Robert M. Burger, *Ph.D.* (*Brown*).

Assistant Professors

Rhett Truesdale George, *M.S.E.E.* (*Florida*); Theo Clyde Pilkington, *Ph.D.* (*Duke*).

Visiting Lecturer

Bruce A. Wells, *M.S.E.E.* (*Oregon State*).

Courses of Instruction

EE 201. Energy Systems
EE 203, 204. Information Systems
EE 207. Network Synthesis
EE 211. Solid-State Theory
EE 212. Solid-State Materials
EE 213. Magnetics
EE 222. Nonlinear Analysis
EE 231. Nuclear Engineering
EE 241. Feedback Control Systems
EE 259. Advanced Electric Energy Conversion
EE 265. Advanced Topics in Electrical Engineering
EE 297, 298. Thesis Research
EE 311. Quantum Theory in the Engineering of Materials
EE 315, 316. Solid-State Devices
EE 321. Nonlinear Electromagnetics
EE 342. Optimum Control Systems
EE 343. Nonlinear Control Systems

Mechanical Engineering

Specialization in the following areas of study is available to students seeking the M.S. degree with a major in mechanical engineering: materials science; compressible and incompressible fluids; engineering mechanics; vibrations; heat transfer; and instrumentation. Emphasis is placed on the application of the fundamental concepts of basic science and engineering science to mechanical design and analysis.

A minimum prerequisite to the graduate courses in mechanical engineering

is a basic knowledge of differential equations, undergraduate thermodynamic theory, mechanics, and machine design.

Professors

Van Leslie Kenyon, Jr., *M.M.E.* (*Delaware*), *Acting Chairman and Director of Graduate Studies*; John Nelson Macduff, *M.M.E.* (*New York University*); James Lathrop Meriam, *Ph.D.* (*Yale*).

Associate Professors

Thomas Allen Boyle, Jr., *M.S. in M.E.* (*Lehigh*); Ernest Elsevier, *M.S. in M.E.* (*Georgia Institute of Technology*); George Wilbur Pearsall, *Sc.D.* (*Massachusetts Institute of Technology*).

Assistant Professors

Gale Herbert Buzzard, *M.S.* (*Duke*); Charles Morgan Harman, *Ph.D.* (*Wisconsin*).

Courses of Instruction

ME 201. Theoretical and Applied Mechanics
ME 202. Theoretical Thermodynamics
ME 221. Analysis of Incompressible and Compressible Fluid Flow
ME 222. Analysis of Heat Transfer
ME 231, 232. Systems Engineering
ME 265. Advanced Topics in Mechanical Engineering
ME 280. Nuclear Reactor Power Cycles
ME 297, 298. Thesis Research

English

The department offers graduate work leading to the A.M., M.A.T., and Ph.D. degrees. A statement of the requirements for the Ph.D. degree may be obtained from the Director of Graduate Studies.

Professors

Benjamin Boyce, *Ph.D.* (*Harvard*); Bernard I. Duffey, *Ph.D.* (*Ohio State*); John L. Lievsay, *Ph.D.* (*Washington*); Clarence Gohdes, *Ph.D.* (*Columbia*), *James B. Duke Professor of English*; Robert M. Lumiansky, *Ph.D.* (*North Carolina*); Holger O. V. Nygard, *Ph.D.* (*California*), *Director of Graduate Studies*; Charles Richard Sanders, *Ph.D.* (*Chicago*); Lionel Stevenson, *B. Litt.* (*Oxon.*), *Ph.D.* (*California*), *F. R. S. L., James B. Duke Professor of English, Chairman*; Arlin Turner, *Ph.D.* (*Texas*); Charles Eugene Ward, *Ph.D.* (*Duke*).

Associate Professors

Louis J. Budd, *Ph.D.* (*Wisconsin*); Oliver W. Ferguson, *Ph.D.* (*Illinois*); Simeon K. Heninger, *Ph.D.* (*Johns Hopkins*); Grover C. Smith, *Ph.D.* (*Columbia*); George W. Williams, *Ph.D.* (*Virginia*).

Courses of Instruction

203. Chaucer
207. Old English Grammar and Readings
208. History of the English Language
209. Present-day English
213. Introduction to Folklore (Not 1965-66)
215, 216. Elizabethan Drama
217. Milton (Not 1965-66)
218. Spenser
219, 220. The Eighteenth Century
221, 222. English Literature of the Early Nineteenth Century
223, 224. English Literature of the Later Nineteenth Century
227. Literary Criticism (Not 1965-66)
229, 230. American Literature, 1800-1865
233, 234. American Literature 1865-1920
235-236. American Literature since 1920
237. English Drama, 1642-1800
239. Shakespeare
244. Literary Biography
251, 252. English Literature of the Seventeenth Century
261, 262. English Literature of the Twentieth Century
264. Major Developments in Contemporary American Poetry

266. Recent Critical Thought
269, 270. Southern Literature
277. English Prose of the Sixteenth Century
278. English Non-dramatic Poetry of the Sixteenth Century
304. Studies in the Metaphysical Poets
306. Studies in Chaucer
311. Beowulf
313. The Traditional Ballad and Folksong
315. Literature of England 1100 to 1500 excluding Chaucer
320. Medieval Romances (Not 1965-66)
322. Genre Studies in Twentieth Century American Literature
330. Textual Criticism (Not 1965-66)
331. Emerson
332. Whitman
333. Hawthorne and Melville
334. Studies in the Critical and Philosophical Ideas of Coleridge and Carlyle
338. Studies in American Realistic Fiction
339. Studies in Shakespeare
340. Studies in Renaissance English Prose (Not 1965-66)
342. Studies in Dryden and his Age
345. The Eighteenth-Century Novel (Not 1965-66)
346. Studies in Swift
347. Studies in Victorian Poetry
348. Studies in Victorian Fiction
363. Studies in British Poetry of the Twentieth Century
374. Studies in American Humor (Not 1965-66)
378. Samuel Johnson's Literary Criticism and Related Topics
100. English for Foreign Students

Forestry

Major and minor work is offered in the scientific aspects of forestry leading to the Master of Arts and Doctor of Philosophy degrees. Work for these degrees may be pursued in forest-tree physiology, wood anatomy and properties, forest pathology, silvics, forest soils, forest mensuration and biometry, forest entomology, forest economics, and forest climatology and hydrology. College graduates who have had specialized training in botany or soil science and in allied basic subjects, such as physics, chemistry, geology, and zoology, may pursue graduate study and research only in the specialized fields for which their previous work has qualified them. For information on professional training in forestry see *Bulletin of the School of Forestry*.

Professors

Roger Fabian Anderson, *Ph.D.* (*Minnesota*); Ellwood Scott Harrar, *Ph.D., Sc.D.* (*Syracuse*), *Chairman*; Paul Jackson Kramer, *Ph.D.* (*Ohio State*), *James B. Duke Professor of Botany*; Aubrey Willard Naylor, *Ph.D.* (*Chicago*); James Granville Osborne, *B.S.* (*University of California*); Charles William Ralston, *Ph.D.* (*Duke*); James G. Yoho, *Ph.D.* (*Michigan State*), *Director of Graduate Studies.*

Associate Professors

Terry W. Johnson, Jr., *Ph.D.* (*Michigan*); Frank Wilson Woods, *Ph.D.* (*Tennessee*).

Assistant Professors

Kenneth Richard Knoerr, *Ph.D.* (*Yale*); William James Stambaugh, *Ph.D.* (*Yale*); John Dennis Sullivan, *Ph.D.* (*Michigan State*).

Courses of Instruction

223. Forest Pathology
230. Forest Entomology
243. Silvics
251. Sampling Methods in Forestry*
257. Design of Forestry Experiments and Analysis of Data*
261. Forest Soils
270. Economics of Forestry
276. Forestry Policy
290. Wood Anatomy
295. Surface Generation in Wood
296. Chemistry of Wood
297. Wood Physics (Mechanics)
301, 302. Advanced Studies in Forestry

321. Research Techniques in Forest Pathology
331. Toxology of Insecticides
332. Ecology of Forest Insects
333. Morphology and Taxonomy of Forest Insects
341. Forest Meteorology
342. Forest Influences
344. Micrometeorology
347, 348. Seminar in Silvics
352. Analysis of Forest Measurements
353. Sampling and Experimental Design in Forestry
357, 358. Research in Forestry
362. Forest Soil Physics
366. Forest Soil Fertility
368. Field Seminars
378. Seminar-Forest Economics
379. Economic Analysis in Forestry
390. Wood-Liquid Surface Interactions
391. Seminar in Wood Science and Forest Products
392. Advanced Wood Physics

Geology

The Department of Geology offers graduate work leading to the A.M. degree. An undergraduate degree in geology is not a prerequisite for graduate studies, but a student must have had or must take introductory courses in mineralogy, sedimentary rocks, stratigraphy, paleontology, and structure. In addition he must have had one year of college chemistry, one year of college physics, and mathematics through calculus.

Graduate courses in the Department of Geology are designed to provide training in the field of environmental sedimentary geology with specialized training in bio-environments, litho-environments, or modern environments.

Minor work is available in the fields of zoology, physics, mathematics, chemistry, or approved courses offered in the Department of Geology at the University of North Carolina at Chapel Hill.

An acceptable thesis is required for the A.M.

Professor

Edward Willard Berry, *Ph.D.* (*Johns Hopkins.*)

Associate Professor

Stephen Duncan Heron, Jr., *Ph.D.* (*North Carolina*).

Assistant Professor

Orrin H. Pilkey, *Ph.D.* (*Florida State*).

Courses of Instruction

203. Advanced Stratigraphy
206. Geological Oceanography
207. Sedimentary Petrography
222. Sedimentary Minerals
234. Marine Geology
305. Physical Environments Seminar
306. Bio-environments Seminar
371, 372. Advanced Topics in Geology

Germanic Languages and Literature

The Department of Germanic Languages and Literature offers graduate work leading to the A.M. degree. Students who expect to major in German should have had sufficient undergraduate courses in Germanic languages to enable them to proceed to more advanced work.

Students who wish to take courses in German for a minor should normally have completed a third-year course (in exceptional cases, a second-year) of college German with acceptable grades.

Professor

Herman Salinger, *Ph.D.* (*Yale*), *Chairman, Director of Graduate Studies.*

Visiting Professor

W. T. H. Jackson, *Ph.D.* (*Washington*).

Associate Professors

Leland R. Phelps, *Ph.D.* (*Ohio State*); Richard K. Seymour, *Ph.D.* (*Pennsylvania*); A. Leslie Willson, *Ph.D.* (*Yale*).

Assistant Professor

Herbert Deinert, *Ph.D.* (*Yale*).

Courses of Instruction

201, 202. Goethe (Not 1965-66)
203, 204. Eighteenth Century*
205, 206. Middle High German* (206, 1965, The Arthurian Romance in Germany)
207, 208. German Romanticism (1965-66)
209, 210. Kleist, Grillparzer, and Hebbel*
211, 212. Heinrich Heine (1965-66)
213. Literature of the Empires, 1866-1918 (Not 1965-66)
214. German Literature since 1918 (Not 1965-66)
215. Seventeenth-Century Literature (1965-66)
216. History of the German Language (Not 1965-66)
218. The Teaching of German (1965-66)
———. Graduate Reading Course (1965-66)

History

A candidate for the degree of Doctor of Philosophy is required to prepare himself for examination in five fields, of which four shall normally be within history and of which one must be in American history or in the history of Western Europe. The choice and delimitation of fields is determined in consultation with his supervisor and the Director of Graduate Studies. The Department offers graduate instruction in Ancient History; Medieval Europe; Modern Europe; American History; England and the Commonwealth; Russia; Latin America; the Far East in the modern period; South Asia in the modern period; military history; and historiography.

Students may receive credit for either semester of a hyphenated course without taking the other semester if they obtain written permission from the instructor and the Director of Graduate Studies.

Professors

John Richard Alden, *Ph.D.* (*Michigan*); Joel G. Colton, *Ph.D.* (*Columbia*); Robert Crane, *Ph.D.* (*Yale*); John Shelton Curtiss, *Ph.D.* (*Columbia*); Arthur Bowles Ferguson, *Ph.D.* (*Cornell*); William Baskerville Hamilton, *Ph.D.* (*Duke*); Irving B. Holley, Jr., *Ph.D.* (*Yale*); John Tate Lanning, *Ph.D.* (*California*); Alan Krebs Manchester, *Ph.D.* (*Duke*); Harold Talbot Parker, *Ph.D.* (*Chicago*), *Director of Graduate Studies*; Robert Samuels Rogers, *Ph.D.* (*Princeton*); Theodore Ropp, *Ph.D.* (*Harvard*); Richard L. Watson, Jr., *Ph.D.* (*Yale*), *Chairman*; Robert Hilliard Woody, *Ph.D.* (*Duke*).

Associate Professors

Frances Dorothy Acomb, *Ph.D.* (*Chicago*); Calvin DeArmond Davis, *Ph.D.* (*Indiana*); Robert F. Durden, *Ph.D.* (*Princeton*); Frederic B. M. Hollyday, *Ph.D.* (*Duke*); William Evans Scott, *Ph.D.* (*Yale*); Mark Van Aken, *Ph.D.* (*California*); Charles Young, *Ph.D.* (*Cornell*).

Assistant Professors

Donald Gillin, *Ph.D.* (*Stanford*); Warren Lerner, *Ph.D.* (*Columbia*).

Courses of Instruction

201-202. The History of Russia, 1801-1917
203-204. The United States, 1850-1900 (Not 1965-66)
205-206. The United States in the Twentieth Century
209-210. Constitutional History of the United States, 1760 to the Present (Not 1965-66)
212. Recent Interpretations of United States History
213-214. The Old South

215-216. Foreign Policy and Diplomacy of the United States
217, 218. Europe Since 1870
221-222. The Age of the Renaissance
223-224. The Old Regime and the French Revolution, 1661-1815
225. The Age of the Reformation
227, 228. Europe in the Nineteenth Century (Not 1965-66)
229. Recent Interpretations of Modern European History
231-232. The Hispanic Colonies and Republics in America
233-234. The Institutional, Cultural, and Social History of Hispanic America
235, 236. European Expansion Overseas
237-238. Europe in the Middle Ages
241-242. Nationalism and Communism in the Far East
245-246. War in the Modern World
247, 248. The History of Modern India and Pakistan, 1757-1947
249-250. Social and Intellectual History of the United States
251-252. Recent European History
257. Social and Cultural History of the Hellenistic World from Alexander to Augustus
258. Social and Cultural History of the Graeco-Roman World
259-260. The Emergence of the New South, 1865 to the Present
261-262. Russia in the Twentieth Century
263-264. American Colonial History and the Revolution, 1607-1789
265-266. Modern South America
267, 268. From Medieval to Modern England
269. British History from 1714 to 1867
270. Great Britain and the Commonwealth of Nations, 1867 to the Present
285. Origins of Indian Civilization
297. The British Empire from the American Revolution to the Boer War
298. The Commonwealth in the Twentieth Century
303-304. The United States in the Twentieth Century
305-306. Seminar—History of England and the British Empire
307-308. Seminar—United States History
309-310. Seminar—American Colonial and Revolutionary History
315-316. Seminar—Southern History
317-318. Seminar—Modern European History
321-322. Seminar—History of Spain, Hispanic American, and Inter-American Relations
343-344. Seminar—History of American Foreign Relations
347-348. Seminar on Recent India
361-362. Seminar in the History of Russia
401. Seminar on the British Commonwealth
410. Seminar on Southern Asia
312. Seminar—The Teaching of History in College
320. Historiography

Hospital Administration

A program leading to the M.H.A. degree provides preparation for a career of administration in hospitals and other health agencies to specially selected graduate students. Admission to this program is limited to 12 students a year, and selection is based upon suitability for the practice of management as well as capability for graduate study. This program normally requires 24 months to complete, as it includes a 12-month administrative residency under faculty supervision in hospitals and related institutions as well as an academic program of 36 graduate units, of which 18 are in Hospital Administration and 18 in designated courses in Economics, Political Science, and Sociology.

Professor

Ray E. Brown, *M.B.A.* (*Chicago*); Charles H. Frenzel, *A.B.* (*Duke*).

Associate Professor

Louis E. Swanson, *A.B.* (*Hamline*).

Assistant Professor

Donald S. Smith II, *M.H.A.* (*Minnesota*).

201. History and Development of Hospitals and Other Health Agencies
203-204. Principles of Organization and Management of Hospitals and Other Health Agencies
211-212. Seminars in Health Administration
215. Administrative Residency

Mathematics

Graduate work in the Department of Mathematics is offered leading to the A.M. and Ph.D. degrees. The student, in his undergraduate work, must have had courses in differential and integral calculus, and at least 6 semester hours of other courses in mathematics on the junior or senior level.

The A.M. degree with a major in mathematics is awarded primarily on the basis of scholarship. Of the 24 units of course work required for this degree, 18 units must be taken in the Department of Mathematics.

The Ph.D. degree in mathematics is awarded upon the demonstration of ability and training in research. The original dissertation, therefore, is the most important of the formal requirements for this degree.

Since a reading knowledge of French, German, and Russian is highly desirable for the student of mathematics, he should satisfy the language requirements in two of these languages as early as possible.

Professors

Leonard Carlitz, *Ph.D.* (*Pennsylvania*); Francis George Dressel, *Ph.D.* (*Duke*); William Whitfield Elliot, *Ph.D.* (*Cornell*); John Jay Gergen, *Ph.D.* (*Rice*), *Chairman*; Francis Joseph Murray, *Ph.D.* (*Columbia*); John Henderson Roberts, *Ph.D.* (*Texas*); Joseph Miller Thomas, *Ph.D.* (*Pennsylvania*).

Associate Professors

Thomas Muir Gallie, Jr., *Ph.D.* (*Rice*); Thomas D. Reynolds, *Ph.D.* (*Duke*); Joseph Robert Shoenfield, *Ph.D.* (*Michigan*); Seth L. Warner, *Ph.D.* (*Harvard*), *Director of Graduate Studies.*

Assistant Professors

Marion Ritchie Bryson, *Ph.D.* (*Iowa State*); Donald Smiley Burdick, *Ph.D.* (*Princeton*); Reece Thomas Harris, Jr., *Ph.D.* (*Illinois*); Lowell Arthur Hinrichs, *Ph.D.* (*Oregon*); John Alexander Kelingos, *Ph.D.* (*Michigan*); Merrell Lee Patrick, *Ph.D.* (*Carnegie Tech.*); Richard Arthur Scoville, *Ph.D.* (*Yale*); David Alexander Smith, *Ph.D.* (*Yale*); Olaf Stackelberg, *Ph.D.* (*Minn.*)

213-214. Modern Algebra (1965-66, Retired Officers Program only)
215-216. Intermediate Analysis (1965-66, Retired Officers Program only)
217-218. Analysis
221. Digital Computer
222. Introduction to Numerical Anaylsis
225. Theory of Equations (Not 1965-66)
227-228. Theory of Numbers (Not 1965-66)
229-230. Algebraic Numbers (Not 1965-66)
233. Statistical Methods
234. Sample Designs
235-236. Abstract Algebra
244. Design of Experiments
245-246. Combination Analysis (Not 1965-66)
247-248. Arithmetic of Polynomials (Not 1965-66)
253-254. Differential Geometry (Not 1965-66)
271-272. Introductory Topology
283. Probability for Engineers
285. Applied Mathematical Methods I.
286. Applied Mathematical Methods II.
287-288. Foundations of Mathematics (also listed as Philosophy 287-288) (1965-66)
291-292. Theory of Functions
325-326. Real Variable
327-328. Partial Differential Equations (Not 1965-66)

331-332. Advanced Topics in Complex Variables (1965-66)
333-334. Analytic Theory of Numbers (Not 1965-66)
337-338. Existence Theorems (1965-66)
343-344. Ordinary Differential Equations (Not 1965-66)
371-372. Dimension Theory (1965-66)
383-384. Lie Groups and Algebras (Not 1965-66)
395-396. Topological Algebra (1965-66)

Microbiology and Immunology

Professors

D. Bernard Amos, *M.D.* (*Guys Hospital, London*); Joseph Willis Beard, *M.D.* (*Vanderbilt*); Norman Francis Conant, *Ph.D.* (*Harvard*), *James B. Duke Professor of Microbiology, Chairman*; John E. Larsh, Jr., *Sc.D.* (*Johns Hopkins*); Ralph Wayne Rundles, *M.D., Ph.D.* (*Cornell*); David Tillerson Smith, *M.D.* (*Johns Hopkins*), *Litt. D., James B. Duke Professor of Bacteriology*; Hilda Pope Willett, *Ph.D.* (*Duke*).

Associate Professors

Eugene D. Day, *Ph.D.* (*Delaware*); Samson R. Gross, *Ph.D.* (*Columbia*), *Director of Graduate Studies.*

Assistant Professors

Richard O. Burns, *Ph.D.* (*Illinois*); Richard S. Metzgar, *Ph.D.* (*Buffalo*); Suydam Osterhout, *M.D., Ph.D.* (*Rockefeller Institute*); Chester M. Zmijewski, *Ph.D.* (*Buffalo*).

Courses of Instruction

M211. Hematology
M221. Bacteriology and Immunology
M291. Medical Parasitology
231. Fundamentals of Immunology
302. Microbial Genetics
303. Animal Viruses and Animal Virus Diseases
310. Microbial Physiology
311. Advanced Immunology
312. Cancer Immunology
313. Immunohematology
314. Immunochemistry
315. Methods in Immunology
316. Transplantation Immunity and Immunogenetics
323. Readings in Bacteriology and Immunology
324. Research Seminar on Viruses
325. Medical Mycology
326-327. Microbiology Seminar
328. Seminar in Immunology

Philosophy

The Department of Philosophy offers graduate work leading to the A.M. and Ph.D. degrees. Tutorial work complements formal instruction. Students may specialize in any of the following fields: the History of Philosophy; Logic; Philosophy of Science; Epistemology; Metaphysics; Philosophical Analysis; Ethics; Aesthetics; Political Philosophy; and Philosophy of Law. Applicants for admission must offer scores of the Graduate Record Examination or the Miller Analogies Test.

Individual programs of study are developed for each student. The following requirements, however, are fundamental: (1) In February of their first year new graduate students in philosophy who are not then taking the preliminary examinations for the Ph.D. are required to take three qualifying examinations: one in the history of philosophy, ancient and modern; one on a central philosophic topic, treated systematically; and one in logic, both classical and symbolic. The examination in logic will be waived if, during the first semester, a student has passed with a grade of E or G Philosophy 331c, Logic. A student's achievement on these examinations will be regarded as indicative of his ability to undertake advanced graduate work. (2) Preliminary examinations for the Ph.D., which may be taken only after a student has met

the language requirements for that degree, should be taken during the first year of study beyond the A.M. degree, but in any case not later than the end of the second year. In these examinations students are expected to combine historical knowledge with critical understanding.

Work in a minor field outside of the Department, but not necessarily confined to any one department, must include six units for the A.M. or the Ph.D. and may include more as a student's program requires or permits.

Professors

Charles A. Baylis, *Ph.D.* (*Harvard*), *Chairman*; Romane Lewis Clark, *Ph.D.*, (*State Univ. of Iowa*); Glenn Robert Negley, *Ph.D.* (*Chicago*); William Bernard Peach, *Ph.D.* (*Harvard*); Paul Welsh, *Ph.D.* (*Cornell*), *Director of Graduate Studies.*

Associate Professor

Neil Leslie Wilson, *Ph.D.* (*Yale*).

Assistant Professors

Robert W. Binkley, *Ph.D.* (*Minnesota*); Marshall Spector, *Ph.D.* (*Johns Hopkins*).

Courses of Instruction

202. Aesthetics
203. Contemporary Ethical Theories
205. Philosophy of History
208. Political Values
211. Plato
217. Aristotle
219. Kant
225. British Empiricism
227. Continental Rationalism
228. Recent and Contemporary Philosophy
229. American Pragmatism
230. The Meaning of Religious Language (also listed as Religion 230)
233. Introduction to the Philosophy of Science (1965-66)
234. Philosophy of Science (1965-66)
235. Philosophy and the Sciences
236. Special Problems in the Philosophy of Science
241. Logic*
246. General Semantics and Theory of Language*
250. Philosophical Analysis
252. Metaphysics
287-288. Foundations of Mathematics (also listed as Mathematics 287-288)
291, 292. Critical Philosophy
331, 332. Seminar in Special Fields of Philosophy

Physics

The Department of Physics offers graduate work leading to the A.M. and Ph.D. degrees. Course work is designed to give a broad basic foundation in classical and modern physics. All graduate students will be expected to acquire a thorough knowledge of the various branches of classical physics and some familiarity with modern physics and with basic laboratory skills. They will be required to take such course work in the 200-number courses as may be necessary to obtain this foundation.

The student will be required to take such course work as will best be adapted to the kind of work he will subsequently specialize in and to the kind of research he will undertake. The choice of minor will be similarly determined.

Since a practical reading knowledge of French and German is highly desirable for the student of physics, he should satisfy these language requirements as early as possible.

Professors

L. C. Biedenharn, Jr., *Ph.D.* (*Massachusetts Institute of Technology*); Henry A. Fairbank, *Ph.D.* (*Yale*), *Chairman*; Earle C. Fowler, *Ph.D.* (*Harvard*); Eugene Greuling, *Ph.D.* (*Indiana*), *Director of Graduate Studies*; Walter Gordy, *Ph.D.*

(*North Carolina*), *LL.D., D. H. C., James B. Duke Professor of Physics*; Harold W. Lewis, *Ph.D.* (*Duke*); Horst Meyer, *D.Sc.* (*Geneva*); Henry W. Newson, *Ph.D.* (*Chicago*); Walter McK. Nielsen, *Ph.D.* (*Minnesota*), *James B. Duke Professor of Physics*; Hertha D. E. Sponer, *Ph.D.* (*Göttingen*).

Associate Professor

Hugh G. Robinson, *Ph.D.* (*Duke*).

Assistant Professors

Edward Bilpuch, *Ph.D.* (*North Carolina*); Lawrence E. Evans, *Ph.D.* (*Johns Hopkins*); Lloyd Fortney, *Ph.D.* (*Wisconsin*); Ichiro Miyagawa, *Ph.D.* (*Tokyo*); Russell Roberson, *Ph.D.* (*Johns Hopkins*); David S. Onley, *D.Phil.* (*Oxford*); David Ronald Tilley, *Ph.D.* (*Johns Hopkins*); Richard L. Walter, *Ph.D.* (*Notre Dame*).

Instructors

Robert Guyer, *Ph.D.* (*Cornell*); Earle Hunt, *Ph.D.* (*Rutgers*); Manfred Winnewisser, *Ph.D.* (*Technical University, Karlsruhe*).

Courses of Instruction

201-202. Mechanics
213-214. Contemporary Physics
217-218. Advanced Physics Laboratory
220. Advanced Electronics
221-222. Theoretical Physics
223-224. Electricity and Magnetism
303. Thermodynamics
304. Statistical Mechanics*
306. Low Temperature Physics
309. Solid State
315-316. Principles of Quantum Theory
317. Intermediate Quantum Theory
319. Electromagnetic Field Theory
323. Theory of Atomic Spectra*
324. Theory of Molecular Spectra*
331. Microwave Radiation (1965-66)
335. Microwave Spectroscopy
341. Advanced Topics in Quantum Theory
343. Nuclear Physics
344. Advanced Nuclear Physics*
345. High Energy Physics
346. Topics in Theoretical Physics*
351-352. Seminar

Physiology and Pharmacology

Professors

Frederick Bernheim, *Ph.D.* (*Cambridge*); Frank Gregory Hall, *Ph.D.* (*Wisconsin*); Eugene M. Renkin, *Ph.D.* (*Harvard*); Daniel C. Tosteson, *M.D.* (*Harvard*), *Chairman.*

Associate Professors

J. J. Blum, *Ph.D.* (*Chicago*); William E. DeTurk, *Ph.D.* (*Duke*); Paul Horowicz, *Ph.D.* (*Johns Hopkins*); E. A. Johnson, *M.D.* (*Sheffield*); Jack L. Kostyo, *Ph.D.* (*Cornell*), *Director of Graduate Studies*; E. Croft Long, *Ph.D.* (*London*); John W. Moore, *Ph.D.* (*Virginia*).

Assistant Professors

P. E. Hochstein, *Ph.D.* (*Maryland*); Thomas J. McManus, *M.D.* (*Boston University*); Athos Ottolenghi, *M.D.* (*Pavia, Italy*); John V. Salzano, *Ph.D.* (*Iowa*); George G. Somjen, *M.D.* (*New Zealand*).

Courses of Instruction

M204. Topics in Muscle Physiology
M205. Physiological Models
M260. Cellular Aspects of Drug Action
M261-262. Human Physiology
M271. Contemporary Physiology
M279. Introductory Seminar in Physiology
M365. Respiration and Aero-Physiology*
M369. Pharmacology, Mode of Action of Drugs
M370. Seminar
M371. Topics in Pulmonary and Cardiovascular Physiology
M372. Research
M373. Cellular Endocrinology
M375. Physiology of Excitable Cells
M377. Cellular Transport Processes
M379. Physiology of the Central Nervous System

Political Science

The Department of Political Science offers graduate work leading to the A.M. and Ph.D. degrees. Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the A.M. degree.

Instruction is designed to prepare the student for teaching, for government service, and for other work related to public affairs. Before undertaking graduate study in political science, a student is ordinarily expected to have completed at least 12 semester hours of course work in political science, including some work in American government.

Fields of political science in which instruction is at present offered for candidates for the degree of Doctor of Philosophy are the following: American Government and Constitutional Law; Comparative Government (with special reference to European Institutions, Southern Asia, Soviet Institutions, or Commonwealth Institutions); Political Theory; American State and Local Government; International Law and Organization; Public Administration; Political Parties and Voting Behavior. Candidates for the degree of Doctor of Philosophy who propose to major in political science must elect five fields, including Comparative Government and Political Theory; at least one of the five fields must be taken in a department other than the Department of Political Science.

Professors

M. Margaret Ball, *Ph.D.* (*Stanford*); Ralph Braibanti, *Ph.D.* (*Syracuse*); Robert Taylor Cole, *Ph.D.* (*Harvard*), *James B. Duke Professor of Political Science*; Robert Howe Connery, *Ph.D.* (*Columbia*); John Hamilton Hallowell, *Ph.D.* (*Princeton*), *Chairman*; Wladyslaw W. Kulski, *Dr.jur.* (*University of Paris*), *James B. Duke Professor of Russian Affairs*; Robert Stanley Rankin, *Ph.D.* (*Princeton*); Robert Renbert Wilson, *Ph.D.* (*Harvard*), *LL.D., James B. Duke Professor of Political Science.*

Associate Professors

Hugh Marshall Hall, *Ph.D.* (*Texas*); Richard Heald Leach, *Ph.D.* (*Princeton*); Jesse Harris Proctor, *Ph.D.* (*Harvard*); Allan P. Sindler, *Ph.D.* (*Harvard*), *Director of Graduate Studies.*

Visiting Associate Professor

William H. N. Hull, *Ph.D.* (*Duke*).

Courses of Instruction

207. American Constitutional Law and Theory
208. American Constitutional Law and Current National Problems
209. Problems in State and Local Government in the United States
221. International Public Organization
223. Political Thought to the Seventeenth Century
224. Modern Political Theory
225, 226. Comparative Government and Politics—European
227-228. International Law
229. Recent and Contemporary Political Theory
230. American Political Institutions
231. American Political Theory*
234. Civil-Military Relationships in American Government*
235. The British Commonwealth*
241. Administrative Management
242. National Administration
244. Administrative Law and Process
246. Government Administration and Public Policy*
250. Comparative Government and Politics—Southern Asia I
251. Comparative Government and Politics—Southern Asia II
275. The National Party System
276. Comparative State Parties and Politics
280. Comparative Government and Politics—Sub-Saharan Africa
291. Problems of Urban Government
292. Urban Administration
301-302. Departmental Graduate Seminar

310. Seminar—State Government
321, 322. Seminar—Political Theory
325, 326. Seminar—Comparative Government—European
327, 328. Seminar—International Law
330. Seminar—Comparative Government and Politics—Southern Asia
341. Seminar—Public Administration*
360. Seminar—Russian Government
361. Seminar—Foreign Relations of the Soviet Union
376. Seminar—Political Behavior
401. Seminar—the British Commonwealth
410. Seminar—Southern Asia

Psychology

The Department offers work leading to the A.M. and Ph.D. degrees. For the Ph.D. degree the areas of concentration are: theoretical experimental psychology, including physiological and comparative psychology; social psychology; and personality clinical psychology. All fields of specialization presuppose thorough preparation in the general methods, data, and theories of psychology. Programs of study are typically arranged to provide this common background in the first year or two, with increasing specialization in course work and research in subsequent years. Early in the second year of residence, the Ph.D. student is expected to have planned his further program of specialized studies; by the end of the second year, when the preliminary is normally taken, the doctoral dissertation plan should be formulated. An original dissertation demonstrating independent research competence and scholarship is the most important formal requirement for the Ph.D. degree.

Students specializing in clinical psychology undertake field work in a variety of settings, and an integral part of this program is a one-year internship in an approved and appropriate institution. Clinical internship is arranged for the third year of study or later year, depending on the student's progress and needs.

Minor work in a variety of fields is available, but the areas most relevant to graduate work in psychology are the biological sciences (zoology, neuroanatomy, physiology), mathematics and statistics, sociology and anthropology, and philosophy of science.

Further details concerning the program of studies in psychology may be obtained from the Director of Graduate Studies in Psychology.

Professors

Donald Keith Adams, *Ph.D.* (*Yale*); Irving Emanuel Alexander, *Ph.D.* (*Princeton*); Bingham Dai, *Ph.D.* (*Chicago*); Irving Thomas Diamond, *Ph.D.* (*Chicago*); Norman Guttman, *Ph.D.* (*Indiana*), *Director of Graduate Studies*; Edward Ellsworth Jones, *Ph.D.* (*Harvard*); Gregory Adams Kimble, *Ph.D.* (*Iowa*).

Associate Professors

Katharine May Banham, *Ph.D.* (*Montreal*); Charles Alan Boneau, *Ph.D.* (*Duke*); Lloyd Joseph Borstelmann, *Ph.D.* (*California*); Jack Williams Brehm, *Ph.D.* (*Minnesota*); Robert Charles Carson, *Ph.D.* (*Northwestern*); Martin Lakin, *Ph.D.* (*Chicago*); Michael Arthur Wallach, *Ph.D.* (*Harvard*).

Associate Research Professor

Mercedes Gaffron, *M.D.* (*Munich*), *Ph.D.* (*Berlin*).

Assistant Professors

John Cooley Altrocchi, *Ph.D.* (*California*); Robert Porter Erickson, *Ph.D.* (*Brown*); Donald Greenwood, *Ph.D.* (*Harvard*); Irwin Kremen, *Ph.D.* (*Harvard*); Harold Schiffman, *Ph.D.* (*Princeton*).

Lecturers

Sanford Irwin Cohen, *M.D.* (*Chicago*); Herbert Floyd Crovitz, *Ph.D.* (*Duke*); Carl Eisdorfer, *Ph.D.* (*New York University*); Ila Gehman, *Ed.D.* (*Pennsyl-*

vania State); Arnold David Krugman, *Ph.D.* (*Kentucky*); Walter Dorn Obrist, *Ph.D.* (*Northwestern*); Talmadge Lee Peele, *M.D.* (*Duke*); Barry M. Shmavonian, *Ph.D.* (*Washington*); George Gustav Somjen, *M.D.* (*New Zealand*); Donald Stedman, *Ph.D.* (*George Peabody*); Larry Wolford Thompson, *Ph.D.* (*Florida*).

Courses of Instruction

203. Psychology of Perception
204. Comparative Psychology
209. Experimental Methods in Psychology
210. Cognition and Higher Mental Processes
213, 214. Conditioning and Learning
215. Developmental Psychology
216. Biological Psychology
217. Research Methods in Social Psychology
218. Social Psychology
220. Physiological Bases of Behavior
234. Seminar in Personality
236. Theoretical Psychology
237. Functional Neurophysiology
238. The Electroencephalogram and Psychological Function
239. Behavioral Correlates of Brain Damage in Man
245, 246. Personality Theory
247, 248. Personality Assessment
253, 254. Personality Development
265. Fundamental Statistical Applications in Psychological Research
266. Advanced Statistical Applications in Psychological Research
271. Selected Problems
282. Introduction to Methods of Psychotherapy
292. The History of Psychology
305. Psychopathology
306. Seminar—Developmental Psychology
309. Seminar—Learning
310. Seminar—Perception
311. Seminar—Instrumental Behavior
312. Seminar—Theoretical Psychology
316. Seminar—Social Psychology
318. Seminar—Social Influence
324. Seminar—Behavioral Studies of the Brain
335-336. Clinical Psychology Practicum
337. Seminar—Sensory Discrimination
341. Principles of Psychotherapy, I
342. Principles of Psychotherapy, II
343, 344. Advanced Seminar in Clinical Psychology*
371. Pre-School Behavior Problems*

Religion

The Department of Religion offers graduate work leading to the A.M. and Ph.D. degrees. Students may major in one of three fields: (1) Biblical Studies; (2) Historical Studies and (3) Systematic and Contemporary Studies.

In addition to course work in these major fields, students will take such other courses in cognate fields as will contribute to the enrichment of their major studies. This minor requirement may be fulfilled either by work in a cognate department, such as Classical Studies, History, or Political Science, or by work in a cognate field within the Department of Religion other than the field of major concentration.

The program of doctoral studies presumes a grounding in religion such as is normally derived from the course content of theoretical subjects of a seminary curriculum. Candidates for admission to the doctoral program are favored, therefore, who hold a B.D. degree from an accredited seminary or who have had at least two years of seminary study beyond the B.A. degree. Students applying for graduate work in religion directly from an undergraduate program should have had a strong undergraduate major in religion, and will be accepted for the Ph.D. program only on the condition of satisfactory completion of the M.A. degree with the department.

Candidates for the Ph.D. degree must complete the language requirements in both French and German not later than the beginning of the second year of residence.

Professors

Hugh Anderson, *B.D., Ph.D.* (*Glasgow*); W. Waldo Beach, *B.D., Ph.D.* (*Yale*), *Director of Graduate Studies*; Kenneth Willis Clark, *B.D., Ph.D.* (*Chicago*); Robert Ellis Cushman, *Ph.D.* (*Yale*); Stuart C. Henry, *B.D., Ph.D.* (*Duke*); Creighton Lacy, *B.D., Ph.D.* (*Yale*); Ray C. Petry, *Ph.D.* (*Chicago*), *LL.D.* (*Manchester*), *James B. Duke Professor of Church History*; James L. Price, *B.D., Ph.D.* (*Cambridge*); William Franklin Stinespring, *Ph.D.* (*Yale*).

Associate Professors

Frank Baker, *B.D., Ph.D.* (*Nottingham*); Egil Grislis, *B.D., Ph.D.* (*Yale*); Frederick L. Herzog, *Ph.D.* (*Princeton*); Hans J. Hillerbrand, *Ph.D.* (*Erlangen*); Robert Osborn, *B.D., Ph.D.* (*Drew*); Herbert Sullivan, *Ph.D.* (*Chicago*).

Assistant Professors

Thomas A. Langford, *B.D., Ph.D.* (*Duke*); Charles K. Robinson, *B.D., Ph.D.* (*Duke*); John Strugnell, *M. A.* (*Oxon.*).

Courses of Instruction

Field I. Biblical Studies

201-202. First Hebrew
207-208. Second Hebrew
209. Biblical Theology
226. Exegesis of the Greek New Testament I
227. Exegesis of the Greek New Testament II
228. The Theology of the Gospel and Epistles of John
301. The Theology of the Dead Sea Scrolls
302. Studies in the Intertestamental Literature
304. Aramaic
305. Third Hebrew
306. Language and Literature of the Dead Sea Scrolls
307. Syriac
309. History of the Ancient Near East
310. Old Testament Prophecy
318. Textual Criticism of the New Testament
340-341. Seminar in the New Testament

Field II. Historical Studies

234. The Theology of Thomas Aquinas
240. The Theology of Richard Hooker (Not 1965-66)
250-251. Studies in Modern Church History (250 also listed as History 225)
260. Seminar: Wesley Studies
279. Religions of East Asia
280. The History of Religions
285. Origins of Indian Civilization
296. Religion on the American Frontier
322. Nineteenth-Century European Theology
331. The Social Message of the Early and Medieval Church
332. The Medieval Church (Not 1965-66)
334. Church Reformers and Christian Unity
336. Christian Mysticism in the Middle Ages (Not 1965-66)
337. The Theology of Martin Luther
338. The Theology of John Calvin (Not 1965-66)
339. Left-Wing Movements of the Reformation
387. Christian Ethics and Social Philosophy
391. Historical Types of Christian Ethics I
392. Historical Types of Christian Ethics II
395. Christian Thought in Colonial America
396. Liberal Traditions in American Theology

Field III. Systematic and Contemporary Studies

210. British Theology
230. The Meaning of Religious Language (also listed as Philosophy 230)
231. Seminar in Christianity and Contemporary Thought
292. Christian Ethics and International Relations
303. Dogma and the Problem of History
320. Seminar: Friedrich Schleiermacher
325. Philosophical Theology I

326. Philosophical Theology II
328. Twentieth-Century European Theology (Not 1965-66)
333. Marxist Ideology and Christian Faith
380. Existentialism
385. Religion in American Literature
386. Theological Trends in the World Church
389. Christian Ethics and Contemporary Culture (Not 1965-66)
390. Current Problems in Christian Ethical Theory
394. Christianity and the State (Not 1965-66)
397. Contemporary American Theology
398. Colloquium on the College and University Teaching of Religion

Romance Languages

The Department of Romance Languages offers graduate work leading to the A.M. and Ph.D. degrees. In order to undertake graduate study in this Department, the student should normally have credit for four years of college courses in the chosen language, or 18 semester hours beyond the conventional two units offered at entrance to college. In addition to this minimum requirement, the student should have had one semester of review in composition and grammar.

It is recommended that candidates for the A.M. degree take a second Romance language as the minor subject.

A candidate for the Ph.D. degree will be required to take some training in Romance linguistics, the amount to be determined by the Department upon consideration of the student's preparation in the field, and a course in methods of literary scholarship.

Professors

Juan R. Castellano, *D.F.L.* (*Madrid*); Clifton Cherpack, *Ph.D.* (*Johns Hopkins*), *Director of Graduate Studies*; Gifford Davis, *Ph.D.* (*Harvard*); Neal Dow, *Ph.D.* (*Pennsylvania*); John Morton Fein, *Ph.D.* (*Harvard*), *Chairman*; Wallace Fowlie, *Ph.D.* (*Harvard*); Richard Lionel Predmore, *D.M.L.* (*Middlebury*); Bruce W. Wardropper, *Ph.D.* (*Pennsylvania*).

Associate Professors

Thomas Howard Cordle, *Ph.D.* (*Yale*); Richard Babson Grant, *Ph.D.* (*Harvard*); Patrick R. Vincent, *Ph.D.* (*Johns Hopkins*).

Assistant Professors

Alexander Hull, *Ph.D.* (*Washington*); Marcel Tétel, *Ph.D.* (*Wisconsin*); William S. Bush, Jr., *Doctorat d'Université* (*Paris*).

French

Courses of Instruction

209. Advanced Composition and Syntax
210. French Phonetics
213, 214. French Classicism (1965-66)
217. Mallarmé and Rimbaud (Not 1965-66)
219. Old French (Not 1965-66)
221, 222. The Nineteenth-Century French Novel (1965-66)
223. French Literary Criticism (Not 1965-66)
225, 226. From Renaissance to Baroque in French Literature of the Sixteenth Century (1965-66)
228. French Poetry of the Twentieth Century (Not 1965-66)
233. Contemporary French Theater (1965-66)
234. Proust (Not 1965-66)
236. Baudelaire (Not 1965-66)
241, 242. French Literature and Thought in the Age of Enlightenment (1965-66)
245, 246. French Literature of the Twentieth Century (1965-66)
248. Three Modern Prophets (Not 1965-66)
311, 312. French Seminar
———. Graduate Reading Course

Spanish

Courses of Instruction

251. The Origins of the Spanish Novel (Not 1965-66)
252. Spanish Lyric Poetry before 1700 (1965-66)
253. The Origins of the Spanish Theatre (Not 1965-66)
255. Modern Latin-American Literature (1965-66)
256. Contemporary Latin-American Literature (Not 1965-66)
258. Old Spanish (1965-66)
259. Spanish Phonetics
260. Advanced Composition and Syntax
261. Nineteenth-Century Novel (Not 1965-66)
264. Modern and Contemporary Spanish Theatre (1965-66)
265. Golden Age Literature: Cervantes (Not 1965-66)
266. Golden Age Literature: The Drama (1965-66)
275. Contemporary Spanish Literature: Essays and Lyric Poetry (Not 1965-66)
276. Contemporary Spanish Literature: The Novel (1965-66)
321, 322. Hispanic Seminar

Italian

Course of Instruction

288. The Renaissance

Romance Languages

Courses of Instruction

R. L. 211. Approaches to Romance Literature
R. L. 218. The Teaching of Romance Languages
R. L. 224. Romance Linguistics

Russian

No graduate degree is now offered in Russian. The following course may serve in the minor programs of students in other departments.

Associate Professor

Bronislas de Leval Jezierski, *Ph.D.* (*Harvard*).

Courses of Instruction

201, 202. The Novelists of Nineteenth-Century Russia

Sociology and Anthropology

The Department offers graduate work leading to the A.M. and Ph.D. degrees in Sociology. Before undertaking advanced work in this department, a student must have completed a minimum of twelve semester hours of approved preliminary courses in the field, and twelve additional semester hours in the field or in related work. Applicants for admission should submit scores on the Graduate Record Examination, especially the Aptitude Test.

Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the A.M. degree. Candidates for the Ph.D. degree are expected to have a broad background in the various aspects of sociology—substantive, theoretical, and empirical. The program of each candidate is determined by a committee which reviews his previous work and sets the specific requirements to be met. These requirements will include work in related fields such as psychology, philosophy, mathematics, economics, or political science. Emphasis is placed on the completion of the dissertation, directed by a member of the staff, demonstrating competence and independence in the investigation of an original and significant problem.

Further details of the program, the departmental facilities, the staff, and

various stipends available are described in a brochure which may be obtained from the Director of Graduate Studies in Sociology.

Professors

Kurt W. Back, *Ph.D.* (*Massachusetts Institute of Technology*); Alan C. Kerckhoff, *Ph.D.* (*Wisconsin*), *Director of Graduate Studies*; Weston LaBarre, *Ph.D.* (*Yale*); George L. Maddox, Jr., *Ph.D.* (*Michigan State*); John C. McKinney, *Ph.D.* (*Michigan State*), *Chairman*; Edgar Tristram Thompson, *Ph.D.* (*Chicago*).

Associate Professors

William M. McCormack, *Ph.D.* (*Chicago*); Jack J. Preiss, *Ph.D.* (*Michigan State*); William L. Rowe, *Ph.D.* (*Cornell*); Donald Francis Roy, *Ph.D.* (*Chicago*); Joel Smith, *Ph.D.* (*Northwestern*).

Assistant Professor

Halliman H. Winsborough, *Ph.D.* (*Chicago*).

Courses of Instruction

230. Society and Culture in India
232. Primitive Religion
234. Personality and Society
236. Personality and Culture
238. Language and Society
241. Social Stratification
242. The Sociology of Occupations and Professions
243. Population Dynamics and Social Change
245. Deviant Social Behavior*
247. Community and Society
253. Social Institutions
255. Race and Culture
272. The Socialization Process
275. Social Attitudes and Individual Behavior
278. Social Structure and the Life Cycle*
281. Development of Sociological Theory
282. Principles of Sociological Analysis*
295. Methodology in Sociology
297. Statistical Analysis in Sociology
330. Seminar in Anthropology
341. Special Problems of Complex Social Systems*
  (a) Industrial and Professional Systems
  (b) Mass Communications
  (c) Urban Society
  (d) Human Ecology
351, 352. Seminar in Social Organization
373, 374. Social Psychological Issues in Sociology
385, 386. Seminar in Sociological Theory
392. Individual Research in Sociology
397, 398. Seminar in Special Research Problems*
410. Seminar in the Government, History, and Social Structure of India and Pakistan*

Zoology

To undertake study toward an advanced degree in zoology, a student should have completed an undergraduate major in zoology or its equivalent. This normally amounts to 24 or more hours of course work distributed among various fields of zoology. The department recognizes the trend in modern biology towards interdisciplinary research, and part of the zoology requirements may be replaced by advanced work in chemistry, mathematics, physics, etc.

Required work for the A.M. degree ordinarily includes 12 units of advanced course work in zoology, 6 units of course work in a minor department, and an additional 6 units of advanced course work in the major or minor department, or in other pertinent departments. Furthermore, an acceptable thesis is necessary for the fulfillment of the degree requirements.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of zoology,

courses in the minor subject, wide reading in science in general and in biology in particular, research, and a dissertation based on original work. Minor work is available in many fields, including anatomy, biochemistry, botany, chemistry, geology, physics, physiology, and psychology.

Professors

Cazlyn Green Bookhout, *Ph.D.* (*Duke*); Irving Emery Gray, *Ph.D.* (*Wisconsin*); John R. Gregg, *Ph.D.* (*Princeton*); Edward Charles Horn, *Ph.D.* (*Princeton*), *Chairman*; Robert J. Menzies, *Ph.D.* (*S. California*); Knut Schmidt-Nielsen, *Mag.Sc., Dr.Phil.* (*Copenhagen*); Karl Milton Wilbur, *Ph.D.* (*Pennsylvania*).

Visiting Professor

Sally Hughes-Schrader, *Ph.D.* (*Columbia*).

Adjunct Professor

Unnsteinn Stefansson, *Ph.D.* (*Copenhagen*).

Associate Professors

Joseph Randle Bailey, *Ph.D.* (*Michigan*); Donald J. Fluke, *Ph.D.* (*Yale*); Wanda Sanborn Hunter, *Ph.D.* (*U.C.L.A.*); Peter H. Klopfer, *Ph.D.* (*Yale*); Daniel A. Livingstone, *Ph.D.* (*Yale*), *Director of Graduate Studies*; F. John Vernberg, *Ph.D.* (*Purdue*); Stephen A. Wainwright, *Ph.D.* (*California*); Calvin L. Ward, *Ph.D.* (*Texas*).

Assistant Professors

John DeForest Costlow, Jr., *Ph.D.* (*Duke*); Vance A. Tucker, *Ph.D.* (*U.C.L.A.*).

Courses of Instruction

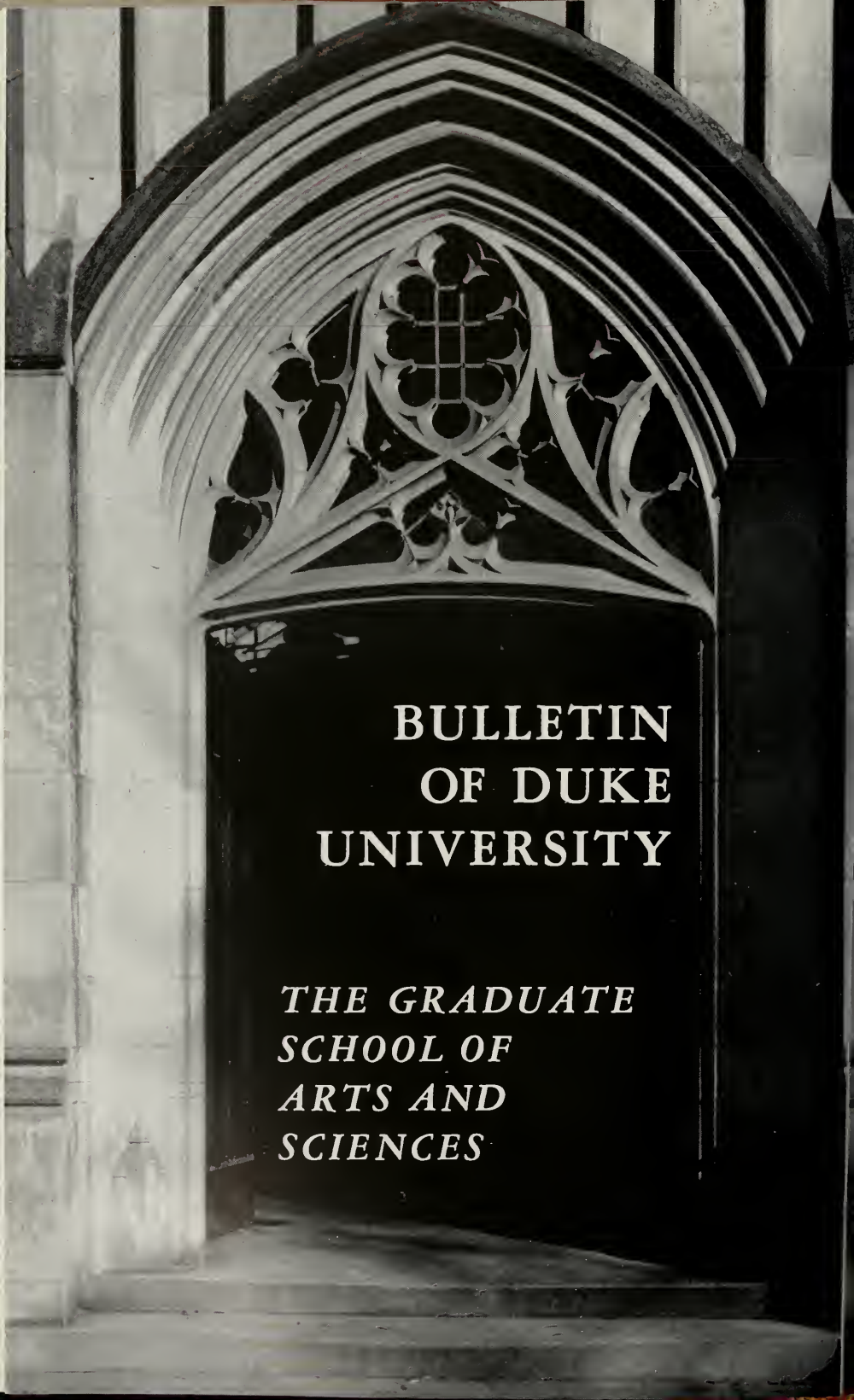
201. Animal Behavior (1965-66)
203. Ecology
210. Experimental Genetics (Not 1965-66)
214. Biological Oceanography
216. Limnology (Not 1965-66)
222. Entomology*
224. Vertebrate Zoology (1965-66)
228. Experimental Embryology (1965-66)
238. Systematic Zoology (Not 1965-66)
245. Radiation Biology (1965-66)
246. Molecular Biology (Not 1965-66)
247. Biological Nucleonics (1965-66)
252. Comparative Physiology
253. Advanced Vertebrate Morphology*
271. Cellular Physiology
274. Invertebrate Zoology*
276. Protozoology*
278. Invertebrate Embryology*
351, 352. Departmental Seminar
353, 354. Research
355, 356. Seminar

Marine Laboratory

203. Marine Ecology
214. Biological Oceanography*
250. Physiological Ecology of Marine Animals (Summer 1965)
274. Marine Invertebrate Zoology
353, 354. Research
355, 356. Seminar

Master's Degree for Students Specializing in Physical Therapy

Students specializing in physical therapy may request admission to the Graduate School and if admitted follow the curriculum for the Master of Arts degree of either the Anatomy or Physiology Department. Selected physical therapy subjects are integrated with the graduate courses the first year. A thesis and the remaining physical therapy courses and practicum may be completed the second year. Upon satisfactory completion of these requirements a Master of Arts degree and a Certificate in Physical Therapy will be awarded. For information concerning the Physical Therapy Program write Miss Helen Kaiser, Director, Physical Therapy Department, Box 3247, Duke University Medical Center.



BULLETIN OF DUKE UNIVERSITY

THE GRADUATE SCHOOL OF ARTS AND SCIENCES

BULLETIN
OF
DUKE UNIVERSITY

The School of Forestry

ANNOUNCEMENTS FOR 1965-66

VOLUME 37 February, 1965 NUMBER 3-B

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For Bulletin of The Summer Session, apply to *The Director of the Summer Session,* Duke University, Durham, N. C., 27706

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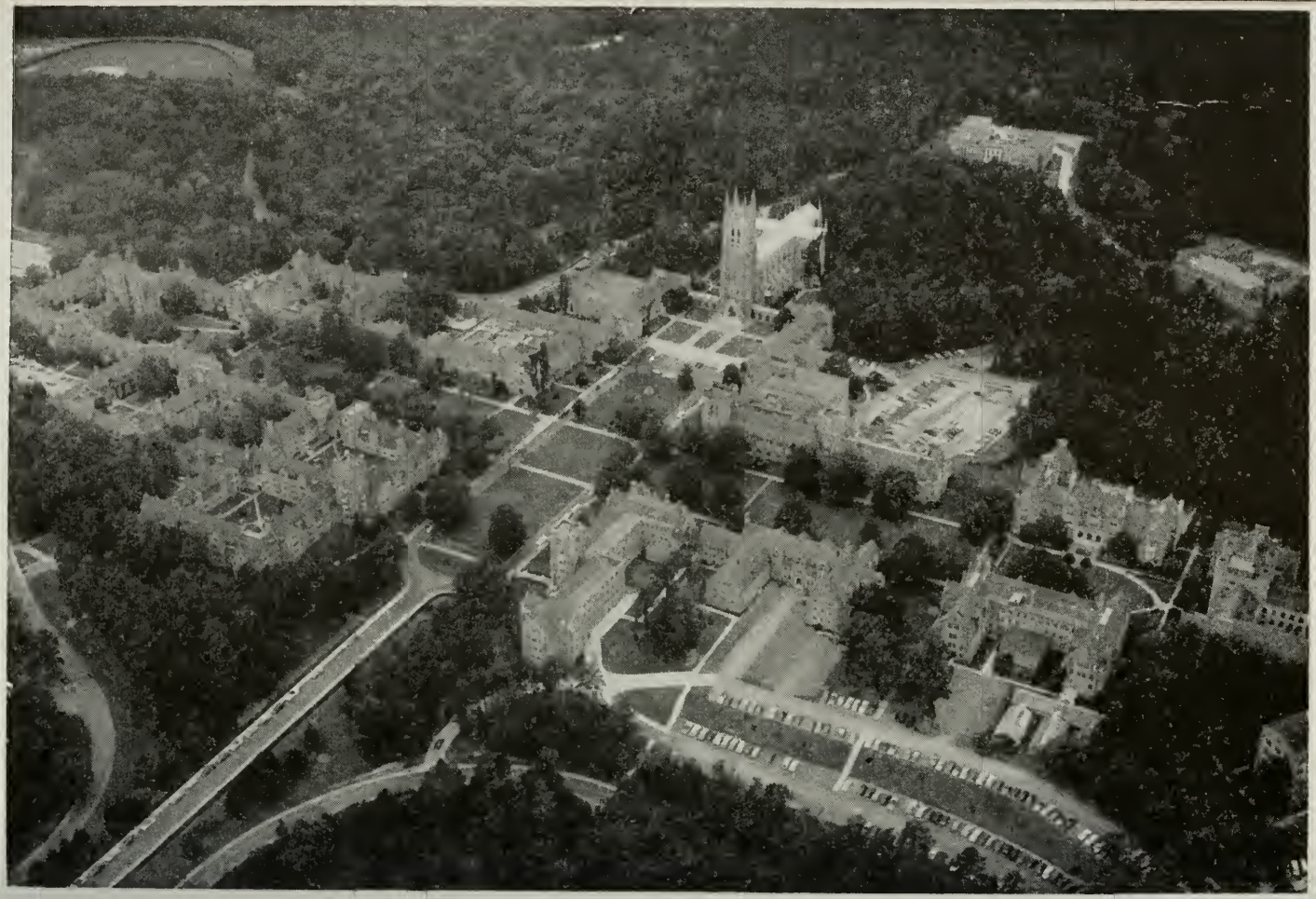
BULLETIN
OF
DUKE UNIVERSITY

THE SCHOOL OF FORESTRY



ANNOUNCEMENTS FOR 1965-66

DURHAM, NORTH CAROLINA
1965



DUKE UNIVERSITY: WEST CAMPUS WITH DUKE FOREST IN BACKGROUND

Contents

School of Forestry Calendar 5

Officers of the University Administration 7

School of Forestry Administration 7

Faculty 8

Staff 9

Forestry in Duke University 10

Educational Facilities 11

The Duke Forest 12

Forest Sciences Laboratory 13

Requirements for Admission to the School of Forestry 14

Requirements for the Degree of Master of Forestry 16

Requirements for the Degree of Doctor of Forestry 19

Forestry in the Graduate School of Arts and Sciences 24

Tuition, Fees, and Expenses 25

Financial Aid 30

Courses and Subjects of Instruction 33

Cooperative Plan of Study with Selected Colleges and Universities 42

Institutions Cooperating with the School of Forestry in Forestry Training 42

Enrollment, 1964-65 45

1965

JULY

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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

School of Forestry Calendar



1965

June	12	Saturday—Registration of students for summer work in forestry.
June	14	Monday—Field work in Dendrology (For. 141) begins.
July	5	Monday—French and Spanish examinations for candidates for graduate degrees, 4:00 P.M., 233 Allen Building. Candidates register in the Graduate School Office not later than June 25.
July	5	Monday—Field work in Forest Surveying and Aerial Photo Interpretation (For. 150) begins.
July	5-9	German examinations for candidates for graduate degrees. Candidates register in the Graduate School Office for these examinations not later than June 25.
August	2	Monday—Field work in Forest Mensuration (For. 151) begins.
September	20	Monday—Reading, Vocabulary and Grammar Tests in French, Spanish and German; French and Spanish 9:00 A.M., German, 10:15 A.M., all in 125 Engineering Building.
September	20	Monday—English Tests for Foreign Students. 2:00 P.M., 125 Engineering Building.
September	20-21	Conference period for new students entering doctoral programs.
September	21	Tuesday—Registration of new students in the School of Forestry.
September	22	Wednesday—Final registration of pre-registered students.
September	23	Thursday—Instruction begins in the School of Forestry.
September	27	Monday—French and Spanish examinations for candidates for graduate degrees, 4:00 P.M., Room 125 Engineering Building. Candidates register in the Graduate School Office for these examinations not later than September 1.
October	11-15	German examinations for candidates for graduate degrees. Candidates register in the Graduate School Office for these examinations not later than October 1.
November	24	Wednesday, 12:30 P.M.—Thanksgiving recess begins.
November	29	Monday, 8:00 A.M.—Instruction is resumed.
December	11	Saturday—Founders' Day.
December	18	Saturday, 12:30 P.M.—Christmas recess begins.

1966

January	3	Monday, 8:00 A.M.—Instruction is resumed.
January	7	Friday—French and Spanish examinations for candidates for graduate degrees, 4:00 P.M., 125 Engineering Building. Candidates register in the Graduate School Office for these examinations not later than December 18, 1965.
January	18	Tuesday—School of Forestry mid-year examinations begin.
January	28	Friday—School of Forestry mid-year examinations end.
January	31	Monday—Reading, Vocabulary and Grammar Tests in French, Spanish and German for entering students, second semester. French and Spanish 10:30 A.M., German, 11:45 A.M., both in 125 Engineering Building.

February	1	Tuesday—Registration of new students in the School of Forestry.
February	3	Thursday—Second semester begins.
March	26	Saturday, 12:30 P.M.—Spring recess begins. Spring field trips begin.
April	4	Monday, 8:00 A.M.—Instruction is resumed.
April	8	Friday—French and Spanish examinations for candidates for graduate degrees, 4:00 P.M., 229 Allen Building. Candidates register in the Graduate School Office for these examinations not later than March 25.
April	15	Friday—Last day for submitting Doctor of Forestry dissertations.
May	2-6	German examinations for candidates for graduate degrees. Candidates register in the Graduate School Office for these examinations not later than April 22.
May	16	Monday—Last day for submitting Master of Forestry theses.
May	19	Thursday, 5:00 P.M.—Second semester classes end.
May	21	Saturday—Final examinations begin.
June	1	Wednesday—Final examinations end.
June	4	Saturday—Commencement begins.
June	5	Sunday—Commencement sermon.
June	6	Monday—Commencement Address and Graduating Exercises.

Officers of the University for the Year 1965-66

General Administration

Douglas Maitland Knight, *Ph.D., Litt.D., LL.D., President of the University*
Robert Taylor Cole, *Ph.D., Provost*
Gerhard Chester Henricksen, *M.A., C.P.A., Vice President for Business and Finance, Treasurer*
Everett Harold Hopkins, *LL.D., Vice President for University Planning and Institutional Studies*
Frank Leon Ashmore, *A.B., Vice President for Institutional Advancement*
Charles Edward Jordan, *LL.D., Vice President for University Relations*
Herbert James Herring, *LL.D., Vice President for Student Life*
Harold Walter Lewis, *Ph.D., Dean of Arts and Sciences, Vice Provost*
Frank Traver deVyver, *Ph.D., Vice Provost*
Barnes Woodhall, *M.D., Vice Provost*
Benjamin Edward Powell, *Ph.D., Librarian*
Richard Lovejoy Tuthill, *Ed.D., University Registrar*
Crauford David Goodwin, *Ph.D., Secretary*
Edwin Constant Bryson, *LL.B., University Counsel*

School of Forestry Administration

Ellwood Scott Harrar, *M.S., Ph.D., Sc.D.* *Dean of the School of Forestry*	2228 Cranford Road
Fred Myerle White, *M.F.* *Assistant to the Dean*	Box 4144 Duke Station
Leon Edward Chaiken, *M.F.* *Director, Duke Forest*	2737 Dogwood Road
James Gibson Yoho, *M.F., Ph.D.* *Director of Graduate Studies in the Department of Forestry of the Graduate School*	2522 Sevier Street

CHAIRMEN, FACULTY COMMITTEES

Admissions: L. E. Chaiken
Alumni Relations and Student Affairs: F. M. White
Library: K. R. Knoerr
Publications: E. S. Harrar
Scholarships and Fellowships: C. W. Ralston

Faculty



Roger Fabian Anderson (1951), *M.S., Ph.D.* *Professor of Forest Entomology*	2528 Perkins Road
Leon Edward Chaiken (1952), *M.F.* *Professor of Forest Management*	2737 Dogwood Road
Ellwood Scott Harrar (1936), *M.S., Ph.D., Sc.D.* *Professor of Wood Science*	2228 Cranford Road
Kenneth Richard Knoerr (1961), *M.F., Ph.D.* *Assistant Professor of Forest Climatology*	4429 Ryan Street
Paul Jackson Kramer (1931), *M.Sc., Ph.D.* *James B. Duke Professor of Botany*	2251 Cranford Road
James Granville Osborne (1961), *B.S.* *Professor of Forest Biometry*	2756 McDowell Street
Charles William Ralston (1953), *M.F., Ph.D.* *Professor of Forest Soils*	2531 Wrightwood Avenue
William James Stambaugh (1961), *M.S., Ph.D.* *Assistant Professor of Forest Pathology*	3211 Sherbon Drive
John Dennis Sullivan (1959), *M.S., Ph.D.* *Assistant Professor of Wood Science*	2710 McDowell Street
Albert Edward Wackerman (1938), *M.F.* *Professor of Forest Utilization*	3610 Dover Road, Hope Valley
Fred Myerle White (1959), *M.F.* *Assistant Professor of Forestry*	Box 4144, Duke Station
Frank Wilson Woods (1958), *M.S., Ph.D.* *Associate Professor of Silviculture*	1509 Pinecrest Road
James Gibson Yoho (1957), *M.F., Ph.D.* *Professor of Forest Economics*	2522 Sevier Street

Faculty Emeriti

Clarence Ferdinand Korstian, *M.F., Ph.D.* *Professor Emeritus of Silviculture and Dean Emeritus of the School of Forestry*	4 Sylvan Road
Francis Xavier Schumacher, *B.S., D.Sc.* *Professor Emeritus of Forestry*	Route 1, Box 106B Lakeside Drive
Frederick Adolphus Wolf, *Ph.D.* *James B. Duke Professor Emeritus of Botany*	924 Urban Avenue

Adjunct Faculty

FOREST SCIENCES LABORATORY
OF THE
SOUTHEASTERN FOREST EXPERIMENT STATION

Robert Lloyd Barnes, *M.F., Ph.D.* *Adjunct Associate Professor of Forest Physiology*	1015 Gloria Avenue

* On sabbatical leave 1965-66.

Edgar William Clark, *Ph.D.*
Adjunct Associate Professor of Forest Entomology — Route 1, Box 474, Cary, N. C.

Charles Sasnette Hodges, Jr., *M.F., Ph.D.*
Adjunct Associate Professor of Forest Pathology — 505 Pleasants Avenue, Cary, N. C.

Louis John Metz, *M.F., Ph.D.*
Adjunct Associate Professor of Forest Soils — 203 Waldo Street, Cary, N. C.

Associate Faculty

Donald J. Fluke (1957), *Ph.D.*
Associate Professor of Zoology — 2703 Sevier Street

Frederick Charles Joerg (1947), *M.B.A.*
Professor of Economics — 2424 Wrightwood Avenue

Terry Walter Johnson, Jr. (1954), *M.S., Ph.D.*
Associate Professor of Botany — 2408 Prince Street

Aubrey Willard Naylor (1952), *M.S., Ph.D.*
Professor of Botany — 881 Louise Circle

STAFF

Mrs. Marie M. Broadwell
Recorder and Secretary to the Dean — 1306 Norton Street

Michael J. Yost, *M.F.*
Superintendent, Duke Forest — 1012 Clarendon Street

Mrs. Edwina Johnson, *B.S. in L.S.*
Librarian, Forestry-Biology — 1606 Peace Street

Mrs. Brenda Lunsford
Bookkeeper, Duke Forest — Route 1, Timberlake, N. C.

Mrs. Patricia Rorie
Secretary — 1914 Washington Street

Mrs. Jo W. Russell
Secretary — 804 N. Alston Avenue

Mrs. Sue P. Woods
Statistical Clerk — 501 E. Lavender Street

Forestry in Duke University

DUKE UNIVERSITY, located at Durham, North Carolina, comprises Trinity College, the Woman's College, the College of Engineering, the Graduate School of Arts and Sciences, and the professional schools of Forestry, Divinity, Law, Medicine, and Nursing. The University dates from 1838, when Union Institute was founded in Randolph County by the Methodists and Friends. In 1851 the institution became Normal College, one of the first schools in America for the training of teachers. In 1859 the name was changed to Trinity College and so continued until 1924, when the College became a part of Duke University.

By virtue of an indenture of trust, executed December 11, 1924, by James Buchanan Duke, a great benefaction was placed at the disposal of humanity by providing for hospitalization, church work in rural communities, and education. The principal feature of the educational provision was the creation of Duke University.

The University, with a student body of over 6,700, occupies two campuses. The Woman's College campus of 108 acres was formerly the campus of Trinity College. About a mile west are the new units of the University, known as the West Campus, totaling 467 acres. It was first occupied in September, 1930.

Forestry in Duke University began early in 1931 when the Duke Forest was placed under intensive forest management and forestry research was initiated. An academic-forestry curriculum, designed for students intent upon pursuing the study of forestry as a profession, was organized in Trinity College of Duke University in 1932. This program was enlarged in 1952 and now includes more than 60 cooperating colleges and universities. (See pages 42-44).

In 1938 the School of Forestry was organized at the graduate level and a curriculum was offered leading to the degree Master of Forestry. Work leading to the degree Doctor of Forestry has been offered since 1940. The School has been fully accredited since its origin. A degree in technical forestry at the undergraduate level is not offered at Duke University.

Graduates of recognized colleges and universities, and professional schools of forestry, and other men who meet the entrance requirements of the School (see page 14), may enroll for training in technical forestry leading to the professional degrees, Master of Forestry and Doctor of Forestry. The Graduate School of Arts and Sciences also

offers graduate work in certain aspects of forestry leading to the degrees Master of Arts and Doctor of Philosophy. This work is available to graduates of schools of forestry of recognized standing, and to college or university graduates holding a Bachelor's degree with their major work in appropriate subjects.

Students taking undergraduate work and who are planning to matriculate in the School for programs of study leading to the degrees Master of Forestry or Doctor of Forestry should refer to the section in this announcement (page 14) where entrance requirements are presented.

Educational Facilities

The School of Forestry is housed in the south wing of the Biological Sciences Building on the West Campus. The programs of the School provide for classroom, laboratory, and field instruction in the fundamental disciplines of forestry and wood science. Specialized training may be elected in forest management, forestry and/or forest products, business management, forest economics, silviculture, silvics, forest entomology, forest biometry, forest pathology, mensuration, forest soils, tree physiology, forest hydrology, forest climatology, wood anatomy, timber physics, chemistry of wood, harvesting and processing, and several other areas in forest products technology.

General and research laboratories are provided for routine and original studies in all of the subject matter fields. These laboratories are equipped with instruments and facilities for quantitative evaluation of biological materials and processes. Greenhouses immediately adjacent to the Biological Sciences Building and the nearby Duke Forest offer excellent facilities for biological investigations in controlled and natural environments. An IBM 7072 Digital Computer system (with supporting 1401 system), housed in the Physics Building, is available for processing research data.

Facilities of allied departments of the University are also available for advanced work in biochemistry, chemistry, economics, genetics, mathematics, plant anatomy, plant ecology, plant pathology, and plant physiology

West Virginia Pulp and Paper Company has made available to Duke University a field headquarters for work in the forests of the South Atlantic Coastal Plain. This camp, located 18 miles northwest of Summerville, South Carolina, is used as a base for field instruction in timber harvesting, wood utilization, soils, silviculture, and forest management.

The School periodically sponsors conferences and symposia on industrial forest management and other technical and scientific sub-

jects. These offer the current viewpoints of many outstanding individuals in both forestry and in allied fields.

The University library, with nearly 1,650,000 volumes and about 4,000,000 manuscripts, provide exceptional resources and facilities for study and research by undergraduate and graduate students, and by visiting scholars. About 60,000 volumes are added annually, while 150 foreign and domestic newspapers and over 7,000 periodicals are received currently. Large collections of microfilms of rare books, newspapers, and periodicals are also available.

The Biology-Forestry library (81,258 volumes), Chemistry library (20,984), Physics-Mathematics library (27,740) are housed for convenience of use in the buildings of these departments. The libraries of the Schools of Divinity (114,740), Law (134,424), Medicine (67,088), and of the College of Engineering (33,203) are also shelved in the buildings of these schools, all on the West Campus.

The Duke Forest

The Duke Forest, of approximately 7,000 acres, is particularly well situated for field work. A five-minute walk from the campus will take one well into many parts of the area, while even the most distant portions can be reached by automobile in about twenty minutes.

Short-term research projects are conducted on the Forest by graduate students in forestry, botany, zoology, and other disciplines. More extensive problems are investigated by the faculty with student assistance, segments of which may be used by students for observation, analysis, and interpretation. Many of these studies serve admirably as instructional material. The Forest provides additional instructional material, as well as demonstrations on an operational scale, of advanced forest practices developed at Duke and elsewhere.

The Forest lies in Durham and Orange Counties near the eastern edge of the Piedmont Plateau. A cross-section of much of the woodlands in the upper coastal plain and lower Piedmont of the Southeast is represented on the Forest with its variety of topography, soil, forest conditions, and patterns of past land use. Elevations range from 280 to 760 feet. The soils are derived from such diverse parent material as metamorphic rock of the Carolina slate formation, granite, Triassic sedimentary rock, and basic intrusives. Nearly one hundred tree species are represented. Some eighteen miles of improved woods roads make all parts of these woodlands readily accessible. It serves as an outdoor laboratory for instruction in forestry and allied fields, and as an experimental forest for research in problems of timber growing and in the sciences basic thereto. It is also used to demonstrate methods of silviculture and forest management applicable to the region.

At few other places in America are there provisions for extensive field study and research in forestry literally at the door of a large university. This natural outdoor laboratory, so conveniently located and representative of the region, is a most valuable supplement to the instructional, laboratory, and library facilities of Duke University.

Forest Sciences Laboratory

The establishment of the Forest Sciences Laboratory research facility of the United States Forest Service's Southeastern Forest Experiment Station in the Research Triangle Park near Durham provides an unusual opportunity for complementing the research programs of students in the School of Forestry. Specialized research projects in forest entomology, pathology, physiology and soils are currently under way at the Laboratory. The research staff of the Laboratory is available for consultation, participation in seminars, and service on graduate committees of students in the School of Forestry. Arrangements may also be made for students to conduct certain aspects of their research at the Laboratory.

Requirements for Admission to the School of Forestry

THE admission requirements of the School of Forestry for work toward the MASTER OF FORESTRY degree presuppose that an applicant is either:

1. A graduate of a professional school of forestry, or
2. A graduate of a college or university of high standing, but without prior professional training in forestry, or
3. A student who has successfully completed the pre-forestry curriculum of one of the colleges (listed on pages 42-43) cooperating with the School in the academic-forestry training program.

Each applicant must present a certified transcript of his academic record showing the courses he has taken, the number of credit hours he has earned and the grades received. The total number of quality points* must be at least two and one-half times the total credit hours to meet the minimum scholastic standards required for admission to the School. An applicant also must have satisfactorily completed undergraduate work in minimum amount as follows:

One year of biology, including at least one semester of botany; or one year of botany.

One year of chemistry.

One course each in physics and the principles of economics.

Mathematics, through college algebra and trigonometry.

It is urged that an applicant without professional training in forestry present additional credits in the above subjects and in one or more of the following disciplines: soils, geology, mineralogy, petrology, climatology, surveying, languages (particularly German and French), sociology, political science, philosophy, psychology, and zoology.

An applicant who is a graduate of a professional school of forestry will present a certified transcript of his scholastic record showing the attainment of a degree. Before registering for the first semester of residence, the students will be required to select the branch or branches of forestry in which they wish to concentrate the major part of their work and to prepare their proposed programs in conference

* Grades for each hour of college are valued in quality points as follows: "A," 4 points; "B," 3 points; "C," 2 points; "D," 1 point; and "F," no points.

with an appropriate faculty advisory committee. Ordinarily, graduates of a fully accredited school of forestry should be able to meet all requirements for the Master of Forestry degree in one full school year of resident study; others may require a longer period of residence.

Students must make application for admission in advance of the opening of the school year. Those students entering without acceptable courses in forest surveying and aerial photo interpretation, forest mensuration, and dendrology must take the work in these subjects in the Summer Session, and are required to submit their applications prior to May 1. Students entering with advanced standings in these courses should make application before September 1. Application blanks will be sent upon request made to the Dean of the School of Forestry.

Admission to the School of Forestry for a program of study and research leading to the degree, DOCTOR OF FORESTRY, is granted to a student who has received the degree, Master of Forestry, or its equivalent, from a school of forestry of recognized standing, and who has achieved an average of three quality points per hour of credit in his previous graduate studies.

An applicant must file a formal application for admission together with transcripts of his undergraduate and graduate academic records. In his application he should clearly state the branch of forestry in which he desires to concentrate, and if possible, the specific research.

The Committee on Admissions of the School of Forestry, together with the prospective student's major advisor, will determine if the qualifications of the applicant meet entrance requirements.

GRADES. Grades in the School of Forestry are as follows: *E* (exceptional); *G* (good); *S* (satisfactory); *F* (failing) and *I* (incomplete).

An *I* (incomplete) indicates that some portion of the student's work is lacking, *for an acceptable reason,* at the time the grades are reported. The instructor who gives an *I* for a course specifies the date by which the student must have made up the deficiency, in no case more than one calendar year from the date the course ended. If the course is not completed, the grade of *F* is entered upon the student's record unless his appeal to the Dean for the grade *No Credit* is approved.

A grade of *F* in any course normally occasions withdrawal from a degree program.

Requirements for the Degree of Master of Forestry

THE requirements for the degree of Master of Forestry (M.F.) are governed by the extent of the student's previous professional training. Normally, students who have earned the degree of Bachelor of Science in Forestry, or equivalent, from an accredited school of forestry may complete the requirements for the M.F. degree in one academic year. Students who have had no prior professional training in forestry are required to complete one summer session and two academic years of resident study. Graduate work of equivalent grade done in residence at other institutions may, with the approval of the Faculty, be accepted as credit toward the degree, but a minimum of one year of residence at Duke University is required.

The submission of a thesis for the M.F. degree usually is required. With the approval of the Faculty, an acceptable report on a special study may be submitted in lieu of a thesis, credit for which will not exceed three semester hours. Four copies of the thesis, typewritten and bound in accordance with regulations set forth by the Faculty, must be deposited with the Dean of the School of Forestry on or before May 15 of the academic year in which the student expects to obtain the M.F. degree.

A student who has not completed his thesis while in residence must submit an acceptable manuscript to the faculty within a period of two years following the termination of his residence.

No student may take less than fourteen nor more than eighteen semester hours of credit per semester without special permission of the Faculty.

POST-PROFESSIONAL PROGRAM

Students with satisfactory undergraduate professional training qualify for advanced study and research in the various disciplines of forestry under this program. A specific study plan is developed for each student through consultation with a faculty advisory committee. For the student planning a managerial career in the general area of forest production or in forest products technology (and where the Master of Forestry is planned as a terminal degree), these study plans usually consist of courses and seminars with a major portion of the work concentrated in the areas of the student's interests. For the

student with research interest, the study plan is oriented within the subject matter field of interest toward the furtherance of a research career, or toward preparing him for academic training beyond the master's level.

A number of senior-graduate courses offered in other departments of the University (see pages 38-41) are open to qualified students in the School of Forestry. One or more of these may be included in a student's study plan when deemed advisable by his advisory committee.

A minimum of thirty semester credit hours, in which the student must earn a grade of E or G in at least nine hours, are required for the degree, Master of Forestry, under this program. Normally, 15 hours of credit (including thesis) must be earned in the School of Forestry.

POST-LIBERAL ARTS AND SCIENCES PROGRAM

A student who has had no prior professional training in the areas of specialization offered in the School of Forestry is required to begin his studies with a summer term of twelve weeks. Two full academic years of study in addition to the work of the Summer Session are required under this program for the attainment of the degree, Master of Forestry. Any student who does not earn a grade of E or G in at least nine hours of work in the first academic year will not be permitted to enter into the work of the second year.

SUMMER SESSION

	S.H.
Dendrology (F. 141)	3
Forest Surveying and Aerial Photo Interpretation (F. 150)	4
Forest Mensuration (F. 151)	4

FIRST YEAR

Fall Semester	S.H.	*Spring Semester*	S.H.
Forest-tree Physiology (F. 201)	3	Harvesting and Utilization of Forests (F. 212)	3
Forest Entomology (F. 230)	3	Harvesting and Forest Products Field Seminar (F. 218)	1
Silvics (F. 243)	3	Forest Pathology (F. 223)	3
Forest Soils (F. 261)	3	Forest Policy (F. 276)	2
Forest Economics (F. 270)	3	Forest Biometry (F. 250)	3
Theory and Practice of Silviculture (F. 244)	3	Wood Anatomy (F. 290)	3
		Forest Management (F. 281)	3

SECOND YEAR

During the latter part of the second semester of the first year each student will be requested to designate the subject matter field (or

fields) he wishes to pursue in the second year. Those who successfully complete the work of the first year will be assigned a faculty advisory committee who, in consultation with the student, will develop his study plan in a manner identical with that described under the Post-Professional Program (see page 16).

FORESTRY BUSINESS MANAGEMENT AND FOREST PRODUCTS BUSINESS MANAGEMENT PROGRAMS

Specialized programs are offered in the School of Forestry, in cooperation with the Department of Economics and Business Administration, to meet the need for forestry graduates well grounded in the principles of economics and well versed in the managerial process. These programs require two calendar years of study and training leading to the degree Master of Forestry and are open to selected students who have already earned the Bachelor's Degree in general forestry, forest management, forest utilization, or wood science and technology and who have demonstrated leadership qualities indicative of potential administrative and executive capacity.

The general requirements of the programs are as follows:

1. Approximately 30 semester hours in courses in economics and business administration or in closely allied fields.
2. Approximately 15 semester hours concentrated in the areas of forestry related to the individuals undergraduate background.
3. Experience as a paid managerial trainee with a cooperating forestry or forest products company or business for a period embracing the included summer and fall semester of the second year.
4. A written analysis of some phase of the managerial operation of the company with which the training period is spent.

A specific program of study, commensurate with each student's academic background and future goals, will be developed by the program Advisory Committee in consultation with the student. A sample of suggested courses included in such programs, and admission application forms are available from the Dean of the School of Forestry.

Requirements for the Degree of Doctor of Forestry

THE degree Doctor of Forestry (D.F.) is a professional and research degree conferred on those students who have satisfactorily completed specified requirements of advanced study and research. Although course work is a necessary part of a student's program, the mere accumulation of course credits will not be sufficient for the attainment of this degree. The granting of the D.F. degree is based primarily upon the student's thorough knowledge of a specialized field of study and upon the production of an acceptable dissertation embodying the results of original research.

Work toward the D.F. degree, consisting of advanced studies in a major and a minor field, is offered with majors in the following branches of forestry: forest economics, forest entomology, forest management, forest mensuration, forest pathology, forest soils, forest-tree physiology, silvics, silviculture, forest biometry, forest hydrology, forest climatology, wood anatomy, timber physics, wood chemistry, and forest utilization. A minor may also be elected in any of these branches of forestry or in other areas of specialized study in the University approved by the faculty of the School of Forestry. Prospective students should correspond with the Dean of the School of Forestry on all matters pertaining to admission to the School.

PROGRAM OF STUDY: A committee consisting of at least four members, including a major advisor, will be appointed by the Dean to supervise the work of each student. The major advisor will serve as Committee Chairman.

The student, in consultation with the advisory committee, will prepare a proposed program of study and research. After acceptance by the Committee, it will be presented to the Faculty of the School of Forestry for final approval. If in the judgment of the Committee the student's prior training is inadequate, he may be required to remedy such deficiencies by taking certain undergraduate courses as prerequisites to continued graduate study, but which will carry no graduate credit.

The program will consist of courses, seminars, arranged work and research, approved for graduate credit by the faculty of the School of Forestry. Satisfactory completion of a minimum of 30 semester hours of formalized academic work in which the student must attain

a grade of E or G in at least 12 hours is required of all prospective candidates. Credit hour requirements for the major and minor fields are determined by the Committee. The student's program of study necessarily demands substantial concentration on courses in his major department. A minor, if elected, will consist of at least 12 semester hours, part or all of which may have been included in the program for the Master's degree. If a minor is not elected, a minimum of six semester hours in a single subject matter area outside the major field must be included in the program of study.

FOREIGN LANGUAGES: A reading knowledge of two foreign languages is required. Normally these will be French and German. Spanish or another foreign language may be substituted for either French or German when deemed advisable by the Committee. The foreign language examinations will be conducted by the appropriate language departments of Duke University. At least one of the language requirements must be met during or before the student's first regularly enrolled semester at Duke University. Students not able to comply with this regulation will be required to reduce their maximum allowable load in succeeding semesters by 3 semester hours until the first language requirement has been met. The second language requirement must be met before the student is permitted to take the comprehensive preliminary examination. Enrollment in non-credit language courses at Duke University will be considered a part of the student's maximum allowable load in any one semester.

LANGUAGE EXAMINATIONS: On Monday of the fall registration period and on the day before spring registration, reading, vocabulary, and grammar tests in French and German are offered (see the Calendar for hour and place). Any entering student who has not taken these tests may do so. On the basis of his scores the student will (1) be certified as meeting requirements in these languages, (2) be advised to present himself for the regular reading examinations at the first opportunity, or (3) be advised to enroll in the special reading courses.

READING EXAMINATIONS: Reading examinations in French and German are offered on those dates listed in the Calendar. Reading examinations in other languages must be separately arranged.

Students requiring the reading examination at other times must pay a special fee of $5.00 prior to registering in the Graduate Office for the examination. Students who require re-examination at scheduled times will be charged $5.00 for each re-examination; if special times are necessary, the fee will be $10.00.

COMPREHENSIVE EXAMINATION: At least six months before the student expects to receive the D.F. degree, and after he has completed most of his formal course work, he will be required to take a

comprehensive examination. The examination will be written in subject areas specified by the Committee and may be followed by an oral examination given by the Committee. The decision as to whether the examination has been passed or failed is the responsibility of the Committee.

PRIVILEGE OF RE-EXAMINATION: Should the student fail the comprehensive examination, he may apply, with the consent of his supervisory committee and of the Dean of the School of Forestry, for the privilege of a second examination to be taken no sooner than three months after the date of the first. Failure on the second examination will render the student ineligible to continue his program for the D.F. degree at Duke University.

Upon satisfactory completion of the comprehensive examination the student will be considered a candidate for the D.F. degree.

RESIDENCE REQUIREMENTS: The minimum period of study beyond the M.F. degree, or its equivalent, is two years of academic work of which at least two regular semesters must be spent in full-time study on the campus in Durham. Graduate work of a fragmentary nature taken over a period of several years will not meet this requirement. Course work of equal grade taken at another college or university of approved standing may, with approval of the Faculty of the School of Forestry, be accepted in partial fulfillment, but shall not exceed 15 semester hours of the total requirements. Such transfer of credit may not under any circumstances be used to reduce the two regular semesters of full-time study which must be spent at Duke University. Course work taken under the cooperative interchange-of-registration plan between the graduate schools of Duke University and the Consolidated University of North Carolina is considered the same as work taken on the campus in Durham.

A student who has successfully completed the 30 hours of required formalized study, met the language requirements, and passed the comprehensive examination, may, with the approval of his supervisory committee and the Dean of the School of Forestry, continue his research and complete his dissertation *in absentia*. Under this arrangement he is required to register for one hour of research credit each semester until the degree has been awarded.

A student who remains in residence after passing the preliminary examination must register for a minimum of three semester hours of research credit each semester unless his course-seminar registration is at least nine hours, in which case the 3-hour registration requirement is waived.

DISSERTATION: In addition to obtaining adequate training in the field of his specialty, the student must demonstrate his ability to plan and conduct sound, original research. Evidence of this ac-

complishment must be presented in the form of an acceptable dissertation embodying the results of original work, which is a definite contribution to knowledge. Course credit is not granted but students must register for dissertation research.

The subject of the dissertation must receive the approval of the Faculty, and the title must be filed with the Dean of the School of Forestry on or before October 15 of the academic year in which the candidate desires to take his final examination.

The dissertation will normally be submitted for acceptance within two calendar years after passing the preliminary examination. Should it not be submitted within four calendar years after the examination, the candidate may, with the approval of his committee, petition the Dean of the School of Forestry for an extension of one year.

If the dissertation is not submitted and accepted within five years after the examination, the candidate must pass a second preliminary examination. Following the second examination, the student's doctoral committee will determine possible additional requirements and set time limits within which the dissertation must be completed and accepted.

After the dissertation has been approved by the major advisor, and at least 10 days prior to the date set for the final examination, the candidate is required to deposit with the Dean of the School of Forestry the original and three typewritten and temporarily bound copies together with 10 copies of an abstract of the dissertation consisting of not more than 600 words. Following acceptance of the dissertation by the Committee, the student will deposit with the Dean of the School of Forestry on or before April 15 of the academic year in which the student expects to obtain the D.F. degree, the original unbound copy of the dissertation together with three carbon copies (also unbound) and 10 copies of the approved abstract. The first carbon copy will be deposited in the University Library, the major advisor will receive one copy, and the fourth copy will be returned to the student. The original copy will be sent to University Microfilms, Ann Arbor, Michigan, where it will be reproduced and published on microfilms. Later the original will be returned to Duke University where it will be bound and deposited in the University Library.

The basic requirements for preparing the dissertation are described in the *Manual of Style for Theses and Dissertations* which may be obtained from the Duke University Book Store, West Campus. Additional instructions concerning the microfilming, preparation of title page and the abstract should be obtained from the Dean's office.

At the time the final approved copies of the dissertation and the abstract are deposited with the Dean of the School of Forestry, the

candidate must show evidence of having paid a fee of $25.00 to the Bursar of the University to cover the costs of microfilming.

FINAL EXAMINATION: The final examination will be in defense of the candidate's dissertation and on related subject matter. It will be oral and will be conducted by the advisory committee. At least six months must elapse between the dates of the preliminary and the final examinations.

Forestry in the Graduate School of Arts and Sciences

MAJOR and minor work is offered in several disciplines of forestry leading to the A.M. and Ph.D. degrees, which are administered by the Graduate School of Arts and Sciences. Work for these degrees may be pursued only in forest-tree physiology, wood anatomy and properties, forest pathology, silvics, forest soils, forest biometry, forest climatology, forest entomology, and forest economics. Students who have had specialized training in botany or soil science and in allied basic subjects, such as physics, chemistry, geology, and zoology, may pursue graduate study and research only in the specialized fields for which their previous work has qualified them.

Applicants for admission to the Graduate School must ordinarily have made not less than a "B" average in their undergraduate work, and must not have concentrated excessively in one field of study to the detriment of a rounded program. They should have met substantially the requirements for the A.B. or B.S. degree at Duke University.

In addition to fulfilling the usual requirements for admission, the applicant must satisfy the Director of Graduate Studies in Forestry as to his liberal arts training, as well as to his preliminary training in the field of forestry.

For detailed information concerning admission to the Graduate School, and for regulations governing candidacy for the A.M. and Ph.D. degrees, language requirements, residence requirements, and other regulations concerning these degrees, the student should consult the *Bulletin* of the Graduate School of Arts and Sciences.

Tuition, Fees, and Expenses

THE following table shows the general fees and charges collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration and no student is admitted to classes until arrangements have been made with the Bursar of the University for the settlement of fees.

General Fees

Tuition, per semester	$525.00
General Fee, per semester	$ 72.50
Spring field seminars	$ 10.00
Absentia Fee, per semester (when applicable)	$ 40.00

Forestry students may obtain admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of an athletic fee of $15.00 per year plus any Federal taxes that may be imposed. This fee is payable in the fall semester.

TRANSCRIPTS: A student is entitled to one free transcript of his academic record. A charge of one dollar is made for each additional copy.

PAYMENTS TO FELLOWS AND SCHOLARS: Payments by the University of stipends to fellows and scholars are made in eight monthly installments, beginning October 20. Fellows and scholars are required to pay the regular tuition fee and such additional fees as are ordinarily required of all graduate students.

Living Accommodations

The Men's Graduate Center is available to men of the graduate and professional schools. It contains bedroom facilities for four hundred men, complete with lounges, study rooms, recreational rooms, post office and dining hall. The rooms are equipped for two persons and the rental charge for a double room in $500.00 for the academic year, or $250.00 for each occupant, or $125.00 for each occupant each semester.

Rooms are rented for the academic year, but for no period of less than one semester. No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedules.

Room reservations are made through the Housing Bureau only after official acceptance for admission to the University. A $25.00 room deposit is required of each applicant before a room reservation is made. The initial room deposit is effective during the student's residence in the University if attendance is continuous in regular academic years. This deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated.
b. Upon withdrawal from the University, provided written notice is received in the Housing Bureau by August 1, for cancellation of a reservation for the fall semester; and not later than January 15, for cancellation of a reservation for the spring semester.
c. When the reasons requiring withdrawal are beyond the student's control.

No refund is made until the occupant has checked out of his room through the Housing Bureau and has settled all of his accounts with the Treasurer.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of the reservation in accordance with the plan that is published during the school year.

Any exchange of rooms must be arranged at the Housing Bureau. Persons exchanging rooms without the approval of the Housing Bureau will be subject to charges for both rooms.

The authorities of the University do not assume responsibility for the persons selected as roommates. Each student is urged to select his roommate when the room is reserved.

Beds and mattresses (39″ x 74″), tables, chairs, dressers, mirrors, and window shades are furnished by the University. The student supplies linens, blankets and pillows. Rugs, totaling not more than 54-square-feet, study lamps and curtains are permissible, and if desired, are furnished by the students.

Duke University Apartments are available to married graduate students. The rental rates per month have been set at $70 for an efficiency apartment, $80 for a one-bedroom apartment, and $90 for a two-bedroom apartment. For further information on apartments for married students, write to the Housing Bureau, Duke Station, Durham, North Carolina.

Duke University desires to provide for its students a residential environment conducive to academic achievement, the development of high ideals, and sound character. The institution asks and believes that each student will cooperate in achieving these aims by arranging his personal belongings in an orderly manner, by caring for the build-

ings and furniture as he would in his own home, and by observing a code based on gentlemanly behavior in an educational environment which demands respect for all residents. Regulations governing the occupancy of rooms will be supplied directly from the Housing Bureau when room reservations are made. Occupants are expected to abide by these regulations.

Firearms (including air rifles) may be brought into the residence halls only upon written permission and registration with the Dean of Men of Duke University.

Dining Service

The dining facilities on the West Campus include three cafeterias with multiple-choice menus, and the Oak Room where full meals and a la carte items are served. The cost of the academic year ranges from $450.00 upward depending on the tastes of the individual.

In the Men's Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge where sodas and sandwiches are served from 11:30 A.M. to 11:00 P.M. The prices in these dining rooms are the same as those on the West Campus.

It is hoped that present rates may be maintained. Charges, however, are necessarily dependent on costs of labor, food, and materials, and some adjustment may be necessary.

Due to the large number of those served in the dining halls, it is not possible to arrange special diets for individual students. Special diet for the sick is served in the infirmary.

Estimated Expenses for an Academic Year

The necessary expenses of a graduate student are moderate. The University dormitories provide thoroughly comfortable and wholesome living conditions at a minimum cost, while all charges made by the University have been kept low. Incidental expenses naturally depend upon the tastes and habits of the individual. The following table summarizes expenses in the School of Forestry for one year:

	Low	Moderate	Liberal
Tuition	$1050.00	$1050.00	$1050.00
General Fees	145.00	145.00	145.00
Room-rent	250.00	250.00	300.00
Board	450.00	500.00	550.00
Laundry	25.00	35.00	45.00
Books	50.00	60.00	70.00
Athletic Fee (optional)	15.00	15.00	15.00
Spring field seminars	10.00	10.00	10.00
	$1995.00	$2065.00	$2185.00

Medical Care

Forestry students who pay at least $\frac{3}{5}$ full tuition and fees for the semester or the term of the Summer Session during which illness occurs are eligible under the Student Health Program. They are not covered during vacations and their dependents and members of their family are not covered at any time. Care is provided for men at the Student Health Office in Duke Hospital.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth and of all chronic and pre-existing conditions, and elective surgery.

Forestry students are urged to carry adequate health insurance to supplement Student Health Program service. If students have insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of their medical care. The complete medical facilities of the Duke University Medical Center are available to all members of the University community.

Motor Vehicles

Every motor vehicle operated on the campus by students enrolled in Duke University must be registered at 08 Social Science Building within five days after arrival and thereafter must display the proper decal emblem. To register a vehicle, the student must present the following documents: (1) state vehicle registration, (2) state operator's license, (3) evidence of automobile liability insurance as required by North Carolina law ($5,000 per person, $10,000 per accident for personal injuries; $5,000 for property damage).

All students owning motor vehicles and living in a University dormitory are required to pay an annual parking rental fee of $30.00.

Student Activities

Forestry students new to Duke University are reminded that they are welcome to use such recreational facilities as swimming pools, tennis courts, golf course, and to affiliate with choral, instrumental, drama, and religious groups.

Students are encouraged to maintain broad professional contacts by participation in the activities of the Society of American Foresters, the Forest Products Research Society, the national honorary scientific

society of Sigma Xi, and other societies appropriate to their major field of study.

The social and business events of the Forestry Club provide opportunities for many pleasant extracurricular activities. An active organization of the wives of forestry students offers a regular schedule of social occasions of interest to this group.

University Counseling Center

The University maintains a Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. In addition, the Bureau administers special group testing programs for University schools and departments and serves as the local testing center for a wide variety of national testing programs. The Bureau also carries on programs of research in the field of measurement and counseling.

Appointments Office

Duke University maintains an active Appointments Office which has steadily been placing students in teaching, governmental and industrial positions. The services of this office are available without charge to graduate students. Those who are interested in securing employment through the Appointments Office, or those who wish to have available for their own use in securing employment a complete file containing their academic record and pertinent recommendations, should register in this office.

Financial Aid

Fellowships, Scholarships, and Assistantships

A NUMBER of fellowships, scholarships, and assistantships are allocated to the School of Forestry for the encouragement and financial assistance of men who offer promise of becoming leaders in the forestry profession. These are awarded to applicants of high character on the basis of scholastic ability as judged by previous educational performance, professional experience, personal references and the Graduate Record Examination.

Holders of the awards will pay tuition and such additional fees as are regularly required.

The awards are of three classes:

FELLOWSHIPS: From five to eight fellowships, with stipends ranging from $1500-$2500 per academic year. Each recipient must have previously completed work equivalent to that required at Duke University for a Master's degree with a major in forestry or in a discipline basic to forestry. He will devote his time to an approved program of study and research in any of the branches of forestry. He is expected to become a candidate for the degree of Doctor of Forestry or Doctor of Philosophy.

SCHOLARSHIPS: From fifteen to eighteen scholarships with stipends ranging from $1250-$2000 per academic year. Each recipient will normally devote his time to an approved program of study leading to the degree of Master of Forestry, or Master of Arts with a major in forestry.

GRADUATE ASSISTANTSHIPS: One to several graduate assistantships with variable stipends up to $3600, depending upon available funds and upon whether granted for the academic year only, or the academic year plus the summer. Each recipient will devote half-time to research or other work of the School of Forestry. He will be permitted to enroll for not more than 20 semester hours in an academic year in an approved program of study, or study and research, leading to a degree of Master of Forestry, Master of Arts, Doctor of Forestry, or Doctor of Philosophy.

Two $3200 research assistantships, one in Forest Pathology, one in Forest Entomology, sponsored by the Southern Forest Disease and Insect Research Council, are available to qualified candidates.

Three industry-sponsored stipends are also awarded annually to qualified scholars. These are: *The Koppers Company, Inc. Scholarship* of $1600.00; and *The Brunswick Pulp and Paper Company Fellowship for Research in Hardwood Silviculture* of $2000.00, and *The Lilly Company Scholarship* of $1600.00.

APPLICATION FOR AWARDS: Any student admitted to the School of Forestry is eligible to apply for a fellowship, a scholarship or an assistantship. Application for these awards may be made concurrently with the application for admission.

The general procedures and requirements for applying for any financial award in the School of Forestry are outlined below. Applicants should initiate the necessary action early to insure that the required documents are filed with the Dean of the School of Forestry on or before March 1 prior to enrollment.

1. File award application. Form will be supplied by the School of Forestry on request.
2. Furnish supporting documents as follows:
   a. Official transcripts of record of all previous college or university credits earned.
   b. Letters of reference from at least three persons familiar with the applicant's character, scholarship, and professional ability.

(Documents offered in support of admission, if so designated, may also serve in support of the application for financial award.)

3. Complete the Aptitude Test of the Graduate Record Examination. Instructions and application for admission to this locally administered examination are available on most college campuses, from the Duke School of Forestry, or by writing the Educational Testing Service, Princeton, New Jersey. Applicants should plan to take this examination in January or earlier.

Notification of awards is made on April 1. In case vacancies occur, completed applications received after March 1 will be considered at a later date.

In every instance where a graduate assistantship, scholarship, or fellowship for the next academic year is offered to an actual or prospective graduate student and accepted before April 15, the accepter may resign his appointment without prejudice prior to that date by notification in writing to the Dean. However, an acceptance given or left in force after April 15 obligates him not to accept another appointment without first obtaining formal release from the Dean of the School.

Student Loans

Students who have completed at least one semester in residence and who have satisfactory academic and citizenship records are eligible to apply for student loans. Loan funds held in trust by the University as well as funds supplied by the federal government through the National Defense Education Act of 1958, are available to qualified students.

Loans from university funds generally mature after borrowers have left the University. Interest accrues on long-term loans from University funds at the rate of one percent per annum from the date of each note. After a student has left the University permanently, the loans begin accruing interest at the rate of three per cent per annum.

In addition to local loan funds, Duke University participates in the student loan program established under the provisions of the National Defense Education Act of 1958. Repayment of these loan funds normally begins one year after the student terminates his education at the University. Interest accrues at the rate of three percent per annum commencing at the time of the first payment, with complete repayment scheduled within a ten-year period. Special benefits to those teaching in the public schools permit a portion of the loan to be cancelled depending upon the length of teaching service. Complete details regarding the student loan program may be obtained by writing directly to the Executive Secretary of the University Scholarship Committee.

The Student Loan Committee in approving loan applications selects those students who, from the standpoint of character, scholastic attainment, personality and degree of financial need, are deserving of this consideration. All applications for loans should be made to the Executive Secretary of the University Scholarship Committee.

Courses and Subjects of Instruction

SCHOOL OF FORESTRY COURSES

IN THE SUMMER SESSION

141. DENDROLOGY.—Nomenclature, classification, and identification of woody plants with special reference to species indigenous to southeastern United States and other important forest regions of temperate North America. Laboratory and field studies in the southern Appalachian Mountains, Piedmont Plateau, and South-Atlantic Coastal Plain. Prerequisite: One year of biology including botany. *Three weeks, eight hours a day beginning June 14, 1965.* 3 s.h. (w)
ASSISTANT PROFESSOR WHITE

150. FOREST SURVEYING AND AERIAL PHOTO INTERPRETATION.—Application of plane surveying to forest problems including the use and adjustment of instruments; boundary, topographic and cover-type surveys; details of land ownership, title and transfer. Principles of aerial photogrammetry and interpretation of photographs for forest mapping and mensuration. Prerequisite: trigonometry; engineering graphics desirable. *Four weeks, eight hours a day beginning July 5, 1965.* 4 s.h. (w) PROFESSOR CHAIKEN

151. FOREST MENSURATION.—Field studies in methods of measuring content and growth of trees and forest stands; practice of timber estimating, log scaling, use of mensurational instruments, and collection of basic data. *Four weeks, eight hours a day beginning August 2, 1965.* 4 s.h. (w) PROFESSOR OSBORNE

REGULAR SESSION COURSES FOR SENIORS AND GRADUATES

201. FOREST-TREE PHYSIOLOGY.—The principal physiological processes of trees, including water relations, synthesis and use of foods, and growth phenomena. Prerequisites: Botany 1-2 or equivalent; one year of chemistry. 3 s.h. (fall).
PROFESSOR KRAMER

212. HARVESTING AND UTILIZATION OF FORESTS.—Principles, procedures, and cost determinations in harvesting timber products with emphasis on managed forests in North America. Processing of wood as a raw material by important forest industries. 3 s.h. (spring). PROFESSOR WACKERMAN

216. LUMBER MANUFACTURE.—Methods of processing logs for sawn products with emphasis on the principles involved in obtaining maximum volume and quality yield for large and small mills; trends in lumber consumption by regions; use of waste for by-products; the development of new lumber products; and industry problems. Prerequisite: Forestry 212 or equivalent. 3 s.h. (spring).
PROFESSOR WACKERMAN

218. HARVESTING AND FOREST PRODUCTS FIELD SEMINAR.—Field studies of the major regional forest products industries; observation and application of harvesting techniques. 1 s.h. (spring). ASSISTANT PROFESSOR WHITE

223. FOREST PATHOLOGY.—Principles of plant pathology with special emphasis on representative forest tree diseases; introduction to forest products pathology. Related field and laboratory studies of regional tree diseases and deterioration of wood products. Prerequisite: Botany 1-2, or equivalent. 3 s.h. (spring). ASSISTANT PROFESSOR STAMBAUGH

230. FOREST ENTOMOLOGY.—Principles of protecting forests from injurious insect infestations; characteristics and identification of insect-caused damage to trees and wood products; identification, biology, and control of the more important tree-infesting insect species. 3 s.h. (fall). PROFESSOR ANDERSON

232. FOREST PRODUCTS ENTOMOLOGY.—Study of the characteristics and

identification of various types of injury to wood products caused by insects and other wood-damaging animals; identification, biology, and control of wood-damaging animals. Prerequisite: Forestry 230 or equivalent. 2 s.h. (spring).
PROFESSOR ANDERSON

243.—SILVICS.—Ecological foundations of silviculture with special reference to forest site factors; influence of forests on their environment; growth and development of trees and stands; origin, development, and classification of forest communities; methods of studying forest environments. Desirable prerequisites: plant physiology, plant ecology, and Forestry 261, or equivalents. 3 s.h. (fall).
ASSOCIATE PROFESSOR WOODS

244. THEORY AND PRACTICE OF SILVICULTURE.—Principles governing establishment, treatment, and control of forest stands; natural and artifical methods of reproduction, intermediate cuttings, and cultural operations with emphasis on the principal forest types of temperate North America. Field practice in silvicultural operations and study of managed stands. Prerequisite: Forestry 243 or equivalent. 3 s.h. (fall). ASSOCIATE PROFESSOR WOODS

248. FOREST REGENERATION.—Fundamentals and practices of regenerating forest stands. Genetic control through recently developed propagating techniques; seed handling in the field, and during preparation for use; techniques for large production tree nurseries; the use of heavy equipment, chemicals, and fire for site preparation and timber stand improvement; recent developments in direct seeding and planting. 3 s.h. (fall). ASSOCIATE PROFESSOR WOODS

250. FOREST BIOMETRY.—Statistical methods essential to the collection, analysis, and interpretation of forest data; includes regression and correlation techniques, Chi-square tests of associations, and tests of significance; short-cut computational procedures. Special attention is devoted to the use of statistical techniques in forest administration and mensuration problems. 3 s.h. (spring).
PROFESSOR OSBORNE

251. SAMPLING METHODS IN FORESTRY.—Statistical background for solution of sampling problems with special references to sampling of forest and associated populations. Prerequisite: Forestry 151. 3 s.h. (Not offered 1965-66).
PROFESSOR OSBORNE

257. DESIGN OF FORESTRY EXPERIMENTS AND ANALYSIS OF DATA.—Role of experimental design in field and laboratory, and statistical analysis of data as aspects of the scientific method in forestry research. 5 s.h. (Not offered 1965-66).
PROFESSOR OSBORNE

261. FOREST SOILS.—Origin, development, and classification of soils with special emphasis on those developed in humid climates; morphological, physical, and chemical properties of soils in relation to growth of trees; effect of forests on soils. Prerequisites: Chemistry 1 and 2, and Physics 1, or equivalent; physical geology, mineralogy, petrology, and analytical chemistry are also desirable. 3 s.h. (fall).
PROFESSOR RALSTON

270. ECONOMICS OF FORESTRY.—Development of the principles of economics useful in the analysis of the past, present, and prospective supply and demand situations for forestry goods and services; problems of the economics of the firm and industry basic and peculiar to forestry, with special attention to the time dimension of value; the role of forestry in the general economy including attention to relevant institutional factors. Prerequisite: at least one course in the principles of economics. 3 s.h. (fall). PROFESSOR YOHO

272. MARKETING FOREST PRODUCTS.—Methods of selling and distributing lumber, timber, and other important forest products in domestic and foreign trade; trade-association functions; regional competition for markets; and transportation problems. Prerequisites: Forestry 212 and 270 or equivalent. 2 s.h. (spring). PROFESSOR WACKERMAN

276. FOREST POLICY.—Objective study and analysis of the development of public land and forestry policies in the United States, present policies of public and private forestry organizations, and current policy issues in the light of economic and other criteria. Prerequisite: Forestry 270. 2 s.h. (spring). PROFESSOR YOHO

281. FOREST MANAGEMENT.—Principles of organizing forest properties for systematic management, use of data obtained in surveys and inventories; principles of forest regulation, including a study of normal and actual forests, rotations, cutting cycles, and methods of regulating the cut in even-aged and all-aged forests for sustained yield; introduction to the preparation of preliminary forest management plans. Prerequisites: Forestry 150, 151, or equivalents. 3 s.h. (spring). PROFESSOR CHAIKEN

283. FOREST PROTECTION.—Impact of destructive agencies upon forests; principles of combustion, fire behavior, danger measurement and suppression; use of fire in forest management. 3 s.h. (fall). PROFESSOR CHAIKEN

285. FOREST-GAME MANAGEMENT.—Principles of management for the sustained production of desirable game and fur animals on forest land; characteristics and biology of important species. 2 s.h. (spring). PROFESSOR ANDERSON

286. FOREST-RANGE MANAGEMENT.—Principles of livestock management by which sustained maximum use can be obtained from forest grazing lands. 2 s.h. (spring). PROFESSOR ANDERSON

290. WOOD ANATOMY.—Study of the physical features and the gross and minute structural characteristics of wood leading to the identification of the commercial woods of the United States, and the important tropical woods used in American wood-working industries. Prerequisites: one year of biology including botany; Forestry 241 or equivalent. 3 s.h. (spring). PROFESSOR HARRAR

291. WOOD-MOISTURE RELATIONS.—Physical principles underlying the response of wood to moisture and its removal; the concept of equilibrium moisture content. Principles and methods involved in drying lumber and other wood products as a step in preparing them for use. Prerequisites: Forestry 212, and 290 or equivalents. 2 s.h. (fall). PROFESSOR WACKERMAN

292. MICROTECHNIQUE OF WOODY TISSUE.—Preparation of wood for microscopic study including sectioning, staining, and mounting techniques; elementary photomicrography. Prerequisite: Forestry 290 or equivalent. 3 s.h. (fall). PROFESSOR HARRAR

293. WOOD PRESERVATION.—Principles, methods, and materials used in treating wood to increase its durability, service-life, and fire resistance. Prerequisites: Forestry 212 and 290, or equivalents. 2 s.h. (fall). PROFESSOR WACKERMAN

295. SURFACE GENERATION IN WOOD.—Directed energy systems; physics of edges; details of wood surface generating machinery; surface generation in relation to wood anatomy; physical measurement of wood surfaces. Prerequisites: For. 290 or equivalent, calculus. 2 s.h. (fall). ASSISTANT PROFESSOR SULLIVAN

296. CHEMISTRY OF WOOD.—Nuclear, atomic and molecular force systems; chemical composition and distribution of chemical components in wood; interaction of wood and moisture; macro-chemical reactions of wood and other cellulosic systems including degradation reactions. Prerequisites: Forestry 290 or equivalent, calculus, organic chemistry. 3 s.h. (fall). ASSISTANT PROFESSOR SULLIVAN

297. WOOD PHYSICS (MECHANICS).—A study of the reaction of wood to mechanical forces; the derivation of working properties and their variance; experimental and standard testing procedures; introduction to theories of elasticity and plasticity; theories of failure; anatomical and moisture effects. Prerequisites: Forestry 290 or equivalent, calculus, college physics, statistics. 3 s.h. (fall) ASSISTANT PROFESSOR SULLIVAN

201A. to 297A. SPECIAL STUDIES IN FORESTRY.—Work on the same level as the foregoing Senior-Graduate courses to meet the needs of individual students. Credit and hours to be arranged. THE STAFF

FOR GRADUATES

301 (fall), 302 (spring). ADVANCED STUDIES IN FORESTRY.—Credits to be arranged. To meet individual needs of graduate students in the following branches of forestry:

A. SILVICS.—Prerequisites: Forestry 241, 243, and 244 or equivalents. ASSOCIATE PROFESSOR WOODS

B. FOREST SOILS.—Prerequisite: Forestry 261 or equivalent.
PROFESSOR RALSTON

C. SILVICULTURE.—Prequisites: Forestry 244, 245, and 246 or equivalents.
ASSOCIATE PROFESSOR WOODS

D. FOREST MANAGEMENT.—Prerequisite: Forestry 281 or equivalent.
PROFESSOR CHAIKEN

E. FOREST ECONOMICS.—Prerequisite: Forestry 270 or equivalent.
PROFESSOR YOHO

F. PROPERTIES OF WOOD.—Prerequisites: Forestry 241, and 290 or equivalents. PROFESSOR HARRAR AND ASSISTANT PROFESSOR SULLIVAN

G. FOREST MENSURATION AND BIOMETRY.—Prerequisites: Forestry 250, and 352 or equivalents. PROFESSOR OSBORNE

H. FOREST ENTOMOLOGY.—Prerequisite: Forestry 230 or equivalent.
PROFESSOR ANDERSON

I. FOREST UTILIZATION.—Prerequisite: Forestry 212 or equivalent.
PROFESSOR WACKERMAN

J. DENDROLOGY.—Prerequisite: Forestry 141 or equivalent.
PROFESSOR HARRAR AND ASSISTANT PROFESSOR WHITE

K. FOREST-TREE PHYSIOLOGY.—Prerequisites: Plant physiology, plant ecology, and silvics. PROFESSOR KRAMER

L. FOREST PATHOLOGY.—Prerequisites: Plant physiology and Forestry 223 or equivalents. ASSISTANT PROFESSOR STAMBAUGH

M. FOREST CLIMATOLOGY AND HYDROLOGY.—Prerequisites: Forestry 341, 342, or equivalents. ASSISTANT PROFESSOR KNOERR

312. COST AND QUALITY CONTROLS IN FOREST UTILIZATION.—Principles and methods of obtaining greatest efficiency of operations and maximum product value in harvesting and processing forest products; factors governing the relation of tree size to net stumpage values; and the application of these principles and methods in the solution of actual case problems. Prerequisites: Forestry 212 and 270 or equivalents. 3 s.h. (spring). PROFESSOR WACKERMAN

321. RESEARCH TECHNIQUES IN FOREST PATHOLOGY.—Fundamental phytopathological methods employed in field and laboratory investigations of tree disease pathogens. Literature review and discussion of current developments. Prerequisite: Forestry 223, or equivalent. 3 s.h. (fall).
ASSISTANT PROFESSOR STAMBAUGH

331. TOXICOLOGY OF INSECTICIDES.—Study of the physical, chemical and biological properties of materials used to destroy insects. Formulation, toxicology and insect physiology as related to insecticide action are emphasized. Prerequisite: one course in entomology; organic chemistry is recommended. 3 s.h. (spring).
PROFESSOR ANDERSON

332. ECOLOGY OF FOREST INSECTS.—Study of the environmental factors as they influence insect population development. Both the physical and the biotic aspects are considered on the basis of field and laboratory experimental methods. Prerequisite: Forestry 230 or equivalent. 3 s.h. (fall). PROFESSOR ANDERSON

333. MORPHOLOGY AND TAXONOMY OF FOREST INSECTS.—Principles of insect structure, classification and nomenclature; laboratory work concentrated on the collection, preservation and identification of both the adult and immature stages of various forest insects. Prerequisite: Forestry 230 or equivalent. 3 s.h. (fall). PROFESSOR ANDERSON

341. FOREST METEOROLOGY.—The science of meteorology, including microclimatology, as it is related to forest biology and hydrology; emphasis is on physical laws governing exchange of heat and moisture in the climatic environment. Prerequisite: One year of college physics; calculus desirable. 3 s.h. (fall).
ASSISTANT PROFESSOR KNOERR

342. FOREST HYDROLOGY.—The influence of forests and other vegetation on local climate, the hydrologic cycle, and soil stability; relationships to water

yield, floods, and erosion. Prerequisite: One year of college physics; calculus desirable. 3 s.h. (spring). Assistant Professor Knoerr

344. MICROMETEOROLOGY.—Physics of the earth's surface environment with emphasis on plant and animal microclimate: budgets of mass, momentum and energy; vertical structure of wind, temperature, and water vapor in relation to exchange processes within the biosphere; local circulation and eddy diffusion. Principles in micrometeorological measurement. Prerequisites: Forestry 341; calculus desirable. 3 s.h. (spring). Assistant Professor Knoerr

347, 348. SEMINAR IN SILVICS.—Advanced topics in silvics are discussed and current research papers and reports are reviewed, analyzed, and evaluated. Prerequisite: Forestry 244 or equivalent. 2 s.h. (fall and spring).
Associate Professor Woods

352. ANALYSIS OF FOREST MEASUREMENTS.—Empirical equations and curve fitting appropriate to forestry data; functional relationships among experimental responses; useful mathematical models for forestry populations; selected non-parametric analysis methods. Prerequisites: Forestry 250 or Mathematics 233 or equivalents. 3 s.h. (spring). Professor Osborne

353. SAMPLING AND EXPERIMENTAL DESIGN IN FORESTRY.—Theory and application of selected sampling designs to forestry populations. Includes multi-stage and multi-phase designs; acceptance and sequential sampling; regression, ratio, and double sampling; sampling with variable probability of selection. Construction and analysis of designs for forestry experiments. Prerequisites: Forestry 250 or Mathematics 230 or equivalents. 3 s.h. (fall). Professor Osborne

357. (fall), 358. (spring). RESEARCH IN FORESTRY.—Credits to be arranged. Students who have had adequate training may do research under direction of members of the Faculty in the branches of forestry indicated under courses 301, 302 with the same prerequisites as thereunder noted; each branch to bear the same letter designation as under courses 301 and 302. Staff

362. FOREST SOIL PHYSICS.—Analysis of the physical properties of soil related to the growth and development of forest trees. Consideration is given to the significance of soil moisture, temperature, aeration, and structural characteristics in the analysis of forest growth relationships. Prerequisite: Forestry 261. 3 s.h. (spring). Offered in alternate years with Forestry 366. Professor Ralston

364. SOIL CLASSIFICATION AND MAPPING.—Classification of soils as natural bodies. Mapping of soils, land use classes and forest site classes; field study will be made of soils in either the coastal plain or mountains. Prerequisite: Forestry 261. 3 s.h. (spring). Professor Ralston

366. FOREST SOIL FERTILITY.—The relationships of soil fertility factors in the growth of forest trees. Emphasis placed on the analysis of soil factors related to the mineral nutrition of trees. Prerequisite: Forestry 261; analytical chemistry is recommended. 3 s.h. (spring). (Not offered 1965-66). Professor Ralston

368. FIELD SEMINARS.—Field studies, consultations, and visits to areas of interest during spring vacation period, or at other times, in the several branches of forestry listed under Forestry 301-302. Credits to be arranged. The Staff

378. SEMINAR IN FOREST ECONOMICS.—Examination and discussion of the application of economic concepts in forestry, the potential contribution of economic analysis to private and public forest management; current research in forest economics. Prerequisites: Forestry 270 and 379 or consent of the instructor; advanced courses in economics and economic theory are desirable. 2 s.h. (spring).
Professor Yoho

379. ECONOMIC ANALYSIS IN FORESTRY.—A critical exploration of static and dynamic economic theory including procedures in activity analysis applicable to forestry problems of resource allocation and production combinations, production location and timing; cost structure and asset control; uncertainty and expectations. Special attention to problems in formulating economic projections and forecasts relevant to forestry. Prerequisite: Forestry 270 or consent of instructor. 3 s.h. (fall). Professor Yoho

386. SEMINAR IN FOREST MANAGEMENT.—Examination and analysis of techniques employed in the management of industrial and public forests, particularly in the South; discussion of problems of large scale intensive forest management. Prerequisites: Forestry 244, 281, and 379 or equivalent. 1 s.h. (spring).
PROFESSOR CHAIKEN

390. WOOD-LIQUID SURFACE INTERACTIONS.—Free surface energy of liquids and solids; theory of adhesion; adhesion for wood substrates; physical and chemical description of adhesives and adhesive joints; wood coatings; physical and chemical properties of surface coating materials. Prerequisite: Forestry 296. 3 s.h. (spring). ASSISTANT PROFESSOR SULLIVAN

392. ADVANCED WOOD PHYSICS.—Theories of elasticity and plasticity; mechanical damping; piezoelectric properties; structure of crystals; fatigue failure. Prerequisites: Forestry 297, Forestry 296, Experimental Design. 3 s.h. (spring).
ASSISTANT PROFESSOR SULLIVAN

398. TROPICAL WOODS.—A study of the properties of various groups of tropical woods with particular emphasis upon those used in marine construction, and for lumber, plywood and furniture. Prerequisite: Forestry 290 or equivalent. 2 s.h. (spring). PROFESSOR HARRAR

399. SEMINAR IN WOOD SCIENCE AND FOREST PRODUCTS.—Application of scientific disciplines to product research and development; wood science in industry. 1 s.h. (spring). PROFESSOR HARRAR AND ASSISTANT PROFESSOR SULLIVAN

OTHER RELATED COURSES

A student in the School of Forestry, may, with the approval of the faculty of the School of Forestry and the Director of Graduate studies of the department concerned, include any of the following courses offered in the Graduate School of Arts and Sciences for which he has had adequate preparation. The student is referred to the *Bulletin* of the Graduate School of Arts and Sciences for the complete descriptive content of each course.

BIOCHEMISTRY AND NUTRITION

Assistant Professor W. L. Byrne, Director of Graduate Studies

	S.H.
201. Introductory Biochemistry	4
203. Chemistry of Natural Products	2
206. Laboratory Methods in Biochemistry	2
301. Energy Metabolism	3
302. Nitrogen Metabolism	2
304. Proteins and Enzymes	4

BOTANY

Professor W. Dwight Billings, Director of Graduate Studies

	S.H.
202. Genetics	4
203. Plant Cytology	4
204. Advanced Plant Anatomy	4
221. Introductory Mycology	4
240. Plant Evolution	3
252. Plant Metabolism	4
254. Plant-Water Relations	3
255. Advanced Taxonomy	4
256. Community Analysis and Classification	3
257. Principles of Plant Distribution	3
258. Physiology of Growth and Development	4
259. The Environment	3
305. Vegetation of North America	3

CHEMISTRY

Professor C. K. Bradsher, Director of Graduate Studies

	S.H.
206. Elements of Theoretical Chemistry	4
215. Advanced Inorganic Chemistry	3
216. Nuclear Chemistry	2
233. Instrumental Analysis	2
234. Chemical Instrumentation	2
251. Qualitative Organic Analysis	2 or 3
252. Advanced Organic Preparation	2
261-262. Physical Chemistry	8
303. Thermodynamics	3
304. Physical Chemistry of Reactions	3
341, 342. Advanced Organic Chemistry	8
350. Organic Reactions	2
352. Mechanisms of Organic Reactions	1
360. Polymer Chemistry	2

CIVIL ENGINEERING

Professor E. I. Brown, Director of Graduate Studies

	S.H.
CE 201. Theoretical and Applied Mechanics	3
CE 202. Advanced Mechanics of Materials and Experimental Stress Analysis	3
CE 231. Structural Theory and Analysis	3
CE 242. Hydraulic Engineering	3

ECONOMICS AND BUSINESS ADMINISTRATION

Professor R. S. Smith, Director of Graduate Studies

	S.H.
201. Senior Seminar in Economics	3
204. Advanced Money and Banking	3
218. Business Cycles	3
219. Economic Problems of Underdeveloped Areas	3
231. Economic History of Europe	3
233. State and Local Finance	3
237-238. Statistical Methods	6
249. Product Markets	3
262. Trade Unionism and Collective Bargaining	3
268. Competition and Monopoly	3
273-274. Auditing, Theory and Practice	6
275-276. Advanced Industrial Accounting and Management	6
277. Income Tax Accounting	3
278. Advanced Problems in Income Taxation	3
279. Budgeting and Control	3
287. Public Finance	3
290. The Use of Quantitative Methods in Business	3
291. Business Policy	3
293. Economic Systems	3
294. Economic Functions of the State	3
295-296. Advanced Accounting Seminar—Theory and Practice	6
301. Economic Analysis	3
304-305. Seminar—Money and Banking	6
307-308. Quantitative Analysis	6
311-312. History of Political Economy	6
313-314. Seminar—Economic Theory	6
315. Seminar—Economic Systems	3
316. Seminar—Economic Functions of the State	3
317. Seminar—Demographic, Population, and Resource Problems	3
319. Seminar—Theory and the Problems of Economic Growth and Change	3
320. Seminar—Trade Cycles, Employment, and Income Theory	3
321-322. Economic Workshop—Economic Development	6
329. Federal Finance	3
330. Seminar—Public Finance	3
331. Seminar—Economic History	3
340. National Income	3
355. Seminar—Labor Economics	3
358. Seminar—Labor Market and Related Analysis	3
365. Seminar—International Economics	3
366. Seminar—Problems in International Trade and Finance	3

386. Seminar—Latin American Economic Problems 3
388. Seminar—Industrial Organization 3
389. Seminar—Industrial and Governmental Problems 3
401. Seminar—British Commonwealth 3

ELECTRICAL ENGINEERING

Associate Professor Harry A. Owen, Jr., Director of Graduate Studies

S.H.
EE 201. Energy Systems 3

MATHEMATICS

Professor J. H. Roberts, Director of Graduate Studies

S.H.
211. Finite Mathematics 3
212. Mathematical Analysis 3
221. Digital Computer 3
222. Introduction to Numerical Analysis 3
233. Statistical Methods 3
234. Sampling Designs 3
244. Design of Experiments 3
283. Probability for Engineers 3
285. Applied Mathematical Methods I 3
286. Applied Mathematical Methods II 3
291-292. Theory of Functions 6
325-326. Real Variable 6

MECHANICAL ENGINEERING

Professor V. L. Kenyon, Jr., Director of Graduate Studies

S.H.
ME 201. Theoretical and Applied Mechanics 3
ME 202. Theoretical Thermodynamics 3
ME 222. Analysis of Heat Transfer .. 3

PHILOSOPHY

Professor Paul Welsh, Director of Graduate Studies

S.H.
241. Logic 3

PHYSICS

Professor E. G. Greuling, Director of Graduate Studies

S.H.
201-202. Mechanics 6
213-214. Contemporary Physics 6
217-218. Advanced Physics Laboratory 2-6
303-304. Thermodynamics and Statistical Mechanics 6
340. Structure of Matter 3

POLITICAL SCIENCE

Associate Professor Alan P. Sindler, Director of Graduate Studies

S.H.
207. American Constitutional Law and Theory 3
241. Administrative Management 3

SOCIOLOGY

Associate Professor A. C. Kerckhoff, Director of Graduate Studies

	s.h.
233. Rural Sociology	3
246. Public Opinion and Propaganda	3
248. Pressure Groups and Public Relations	3

ZOOLOGY

Associate Professor D. A. Livingstone, Director of Graduate Studies

	s.h.
203. Ecology	4
222. Entomology	4
238. Systematic Zoology	4
245. Radiation Biology	3 or 4
246. Molecular Biology	3 or 4
249. Neural and Hormonal Mechanisms in Invertebrates	4
271. Cellular Physiology	4
274. Invertebrate Zoology	4
276. Protozology	4
278. Invertebrate embryology	4

Cooperative Plan of Study with Selected Colleges and Universities

SINCE its inception the Duke School of Forestry has had the cooperation of Trinity College (the men's undergraduate college of arts and sciences of Duke University) in preparing students for professional careers in forestry. Under the plan, a student devotes his first three years to a coordinated and carefully integrated program of study in the basic arts and sciences in Trinity College. The summer between his junior and senior year and the two following school years are spent in the School of Forestry. Upon the successful completion of this five-year course of study, a student will have earned the Bachelor of Science degree from Trinity College and the professional Master of Forestry degree from the Duke School of Forestry.

Based upon the experience and success of this cooperative program with Trinity College, the School of Forestry in 1952 initiated similar programs of collaboration with a selected group of colleges and universities located throughout the United States. These programs offer students the numerous advantages of a broad background in liberal arts and sciences as preparation for later professional training. A student intent upon following such a course of study should make application to one of the colleges listed on pages 42-44. Admission requirements and other information pertinent to matriculation may be obtained from each of these institutions. Not later than the end of the first semester of the third year in the college or university of his choice, the student may make formal application for admission to the Duke School of Forestry. To qualify for admission under these programs, a student must have followed a planned course of study arranged in consultation with his advisor, must have the official recommendation of his college, and must meet the minimum requirements for admission to the Duke School of Forestry.

Institutions Cooperating with the School of Forestry in the Academic-Forestry Program

ALABAMA

Howard College ..... Birmingham 35209

COLORADO

Colorado College ..... Colorado Springs 80903

FLORIDA

Florida Southern College ..... Lakeland 33802
Rollins College ..... Winter Park 32791
Stetson University, College of Liberal Arts ..... Deland 32720

GEORGIA

Mercer University ..... Macon 31207

ILLINOIS

Illinois Wesleyan University, College of Liberal Arts ..... Bloomington 61710

INDIANA

Butler University, College of Liberal Arts and Sciences ..... Indianapolis 46207
Indiana Central College ..... Indianapolis 46227

IOWA

Iowa Wesleyan College ..... Mount Pleasant 52641

KANSAS

Baker University ..... Baldwin 66006

KENTUCKY

Kentucky, University of, College of Arts and Sciences ..... Lexington 40506

LOUISIANA

Centenary College of Louisiana ..... Shreveport 71104

MARYLAND

Western Maryland College ..... Westminster 21158

MICHIGAN

Albion College ..... Albion 49224

MISSISSIPPI

Millsaps College ..... Jackson 39210

MISSOURI

William Jewell College ..... Liberty 64068

NEBRASKA

Doane College ..... Crete 68333

NEW JERSEY

Drew University, College of Liberal Arts ..... Madison 07940

NEW YORK

Hofstra College ..... Hempstead, Long Island 11550

NORTH CAROLINA

Catawba College ..... Salisbury 28144
Duke University, Trinity College ..... Durham 27706
Guilford College ..... Guilford College 27410
High Point College ..... High Point 27262
Wake Forest College ..... Winston-Salem 27106

OHIO

Baldwin-Wallace College ..... Berea 44017
Capital University, College of Arts and Sciences ..... Columbus 43209
Denison University, A College of Liberal Arts and Sciences ..... Granville 43023
Heidelberg College ..... Tiffin 44883
Kent State University, College of Liberal Arts ..... Kent 44240

Marietta College	Marietta	45750
Miami University, College of Arts and Sciences	Oxford	45056
Ohio University	Athens	45701
Otterbein College	Westerville	43081
Wittenberg College	Springfield	45501
Youngstown University	Youngstown	44503

OREGON

Reed College	Portland	97202
Willamette University, College of Liberal Arts	Salem	97301

PENNSYLVANIA

Albright College	Reading	19604
Elizabethtown College	Elizabethtown	17022
Franklin and Marshall College	Lancaster	17603
Gettysburg College	Gettysburg	17325
Juniata College	Huntingdon	16653
Lebanon Valley College	Annville	17003
Lycoming College	Williamsport	17704
Moravian College	Bethlehem	18018
Muhlenberg College	Allentown	18104
Thiel College	Greenville	16125

SOUTH CAROLINA

Furman University	Greenville	29613
Newberry College	Newberry	29108
Wofford College	Spartanburg	29301

TENNESSEE

Carson-Newman College	Jefferson City	37760
Chattanooga, University of, College of Liberal Arts	Chattanooga	37403
East Tennessee State College	Johnson City	37602
Lincoln Memorial University	Harrogate	37752
Tennessee Wesleyan College	Athens	37303
Tusculum College	Greenville	37743

TEXAS

Baylor University, College of Arts and Sciences	Waco	76706
Southwestern University, College of Arts and Sciences	Georgetown	78626

VIRGINIA

Bridgewater College	Bridgewater	22812
Randolph-Macon College	Ashland	23005
Richmond, University of, Richmond College	Richmond	23173
William and Mary, College of	Williamsburg	23185

WEST VIRGINIA

Davis and Elkins College	Elkins	26241
Marshall College	Huntington	25701
West Virginia Wesleyan College	Buckhannon	26201

WISCONSIN

Beloit College	Beloit	53512

Enrollment 1964-65

Registered for the Master of Forestry Degree, 1965

Allbright, John Wesley (B.S.F., Arkansas A & M) Heber Springs, Arkansas.
Brown, Howard Daniel (A.B., David Lipscomb College) White Bluff, Tennessee.
Curtis, Luke (B.S., Duke University) Ossining, New York.
Dale, John William (B.S., University of Illinois) McLeansboro, Illinois.
Daniel, Theodore Hugh (B.S., Louisiana Polytechnic Institute) Camden, Ark.
Ellsworth, Wendell Eugene (B.S., Michigan State) Belding, Michigan.
Fultz, Marvin Clark (William Jewell College) Durham, North Carolina.
Funk, William Frederick (B.S., Pennsylvania State University) Silver Spring, Maryland.
Hay, Ronald Leroy (B.S., Southern Illinois University) Durham, North Carolina.
Ireland, William Louis (A.B., Harvard University) Durham, North Carolina.
Jones, Barry Crisman (B.S., Louisiana State University) Hamburg, Arkansas.
Kaufmann, Merrill Ray (B.S., University of Illinois) Durham, North Carolina.
Lee, John Charles (B.S., North Carolina State College) Raleigh, North Carolina.
McDonald, Peter Garwood (A.B., Brown University) Portland, Oregon.
McIver, Evander Roderick (B.S., University of the South) Conway, South Carolina.
Mignot, Edward Charles (B.S., Albion College) Roanoke, Indiana.
Monahan, Ralph Thomas (Gettysburg College) Rockville, Maryland.
O'Neal, Thomas Denny (B.S., Southern Illinois University) Bloomington, Ind.
Osborne, John David (B.S., Montana State University) Bradford, Penn.
Pleines, William Ernst (Diploma Forest Engineering, Swiss Institute of Technology) Genthod, Geneva, Switzerland.
Reid, Charles Phillip Patrick (B.S.F., University of Missouri) Columbia, Missouri.
Rust, Carl William (B.S., North Carolina State College) Charlotte, N. C.
Sarajar, Christoffel Gerrit (University of Indonesia) Makassar, Indonesia.
Sassaman, Robert William (B.S., Pennsylvania State University) Emporium, Pa.
Seale, Richard Creighton (B.S., Denison University) Babylon, N. Y.
Stack, David Martin (B.S., Southern Illinois University) Aurora, Illinois.
Suratmo, Franciscus Gunarwan (University of Indonesia) Djarkarta, Indonesia.
Tellman, Stephen James (B.S., Albion College) North Olmstead, Ohio.
Tochigi, Toshiro (B.F., Tokyo University) Yokohama, Japan.
Turnbull, John Lexleigh (B.S., University of Stellenbosch) Pietermaritzburg, Natal, S. Africa.
Van Kesteren, Frido (B.S., Pennsylvania State University) The Hague, Holland.
Wartluft, Jeffrey Lee (Thiel College) Chalfort, Pennsylvania.
Weirich, Robert Neil (Elizabethtown College) Jonestown, Pennsylvania.
Wenderoth, John Henry (B.S., Pennsylvania State University) Baltimore, Md.
Wenrich, John Pierce (College of William and Mary) Disputanta, Va.
West, Joseph Woodford (B.S., Duke University) Clarks Summit, Pa.

Registered for the Master of Forestry Degree, 1966

Beattie, William David (Gettysburg College) Staten Island, N. Y.
Bradford, David Morton (Beloit University) Milwaukee, Wisc.
Creem, Timothy (University of North Carolina) Long Island, N. Y.
Darnell, Dennis Ray (Doane College) Lynch, Nebraska.

Finley, Charles Francis (Gettysburg College) Fayetteville, N. C.
Ham, Donald Lee (William Jewell College) East Peoria, Illinois.
Haynes, Dennis Westall (Carson-Newman College) Columbia, Tennessee.
Kemper, Gerald Paul (Elizabethtown College) Lititz, Pa.
Loomis, Robert Charles (Gettysburg College) Lebanon, N. J.
Price, Joseph William (Ohio University) Yellow Springs, Ohio.
Rhyne, Fred David (Carson-Newman College) Maryville, Tenn.
Sites, William Horace (Catawba College) Fayetteville, Pa.
Touvell, Charles Richard (Davis & Elkins College) Coraopolis, Pa.
Yost, Carl Philip (Gettysburg College) Hanover, Pa.
Young, Leslie Hale (Gettysburg College) Norwich, Conn.

Special Student, 1964-65

Kaul, Omkar Nath (B.Sc., S. P. College, Srinagar, India; M.F., Yale University) Srinagar, India.

Registered for the Doctor of Forestry Degree

Anderson, Neil Hamilton (B.S.; M.S., Clemson University), College Park, Texas.
Barnett, James Preston (B.S.; M.F., Louisiana State University), Mena, Ark.
Belt, George Harley, Jr. (B.S., North Carolina State College; M.F., Yale University), Hyattsville, Md.
Bonner, Franklin Thomson (B.S.F., Louisiana State University; M.F., Duke University), Memphis, Tenn.
Box, Benton Holcomb (B.S.; M.S., Louisiana State University), Bogalusa, La.
Brown, James Henry, Jr. (B.S., University of Connecticut; M.S., University of Rhode Island), Oneco, Conn.
Buckingham, Forrest Morgan (B.S., University of New Brunswick; M.F., Harvard University), Ontario, Canada.
DeBrunner, Louis Earl (B.S., University of Cincinnati; M.F., Yale University), Auburn, Ala.
Foil, Robert Rodney (B.S.; M.F., Louisiana State University), Homer, La.
Gray, John Lewis (B.S.F., Pennsylvania State University; M.F., Yale University), Gainesville, Fla.
Hatchell, Glyndon Elbert (B.S., Louisiana State University; M.F., Duke University), Durham, N. C.
Holt, William Robert (B.S.F.; M.S., Pennsylvania State University), Philadelphia, Penn.
Lin, Jim Yung-huan (B.A., Taiwan; M.S., North Carolina State College), Taiwan, China.
Moehring, David Marion (B.S.F., Montana State University; M.F., Duke University), Crossett, Ark.
Ronco, Frank, Jr. (B.S.; M.S., Colorado State University), Fort Collins, Colo.
Strickler, Melvin Dee (B.S.F., Washington State University; M.S., New York State University College of Forestry at Syracuse University), Clarkston, Wash.
Swift, Lloyd Wesley (B.S., New York State University College of Forestry at Syracuse University; M.S., North Carolina State College), Durham, N. C.
Thomas, Richard Joseph (B.S., Pennsylvania State University; M.S., North Carolina State College), Cary, N. C.
Thompson, William Payne (A.B.; M.F., Yale University), Flagstaff, Ariz.
Towers, Barry (B.A., Thiel College; M.F., Duke University), Houston, Texas.
Wahlgren, Harold Emil (B.S.; M.S., Iowa State University), Madison, Wisc.
Wells, Garland Ray (B.S.F., Louisiana Polytechnic Institute; M.F., North Carolina State College), Ruston, La.

Students of Forestry in the Graduate School of Arts and Sciences

Fasick, Clyde Augustus (B.S.F., University of the South; M.F., Duke University), Winchester, Tenn.
Foster, Bennett Bert (B.S., Colorado State University; M.F., Oregon State University), Durham, N. H.

Gay, Lloyd Wesley (B.S., Colorado State University; Diploma of Forestry, Australian Forestry School; M.F., Duke University), Durham, N. C.

Miller, Lee Norman (B.B.A., Southern Methodist University; M.F., Yale University), Durham, N. C.

Neumann, Francis Phillip (B.S., Pennsylvania State University; M.S., University of Minnesota), Stevenson, Md.

Schell, Kerry Franklin (B.S.F.; M.S., Pennsylvania State University), Knoxville, Tenn.

Schultz, Robert Paul (B.S., Michigan State University; M.F., Oregon State University), Durham, N. C.

Steensen, Donald H. J. (B.S.F., Iowa State University; M.F., Duke University), Auburn, Alabama.

Stottlemyer, John Robert (B.S., Pennsylvania State University; M.S., University of Maryland), Blue Ridge Summit, Pa.

Stubbs, Jaek (B.S., Michigan State University; M.F., University of Minnesota), Charleston, S. C.

Weatherspoon, Charles Phillip (B.S., University of Arizona), Tucson, Arizona.

Institutions Represented

Albion College	2
Arkansas A & M College	1
Australian Forestry School	1
Beloit University	1
Brown University	1
Carson-Newman College	2
Catawba College	1
Clemson University	1
Colorado State University	3
David Lipscomb College	1
Davis & Elkins College	1
Denison University	1
Doane College	1
Duke University	9
Elizabethtown College	2
Gettysburg College	6
Harvard University	2
Iowa State University	2
Louisiana Polytechnic Institute	2
Louisiana State University	5
Michigan State University	3
Montana State University	2
North Carolina State College	8
Ohio University	1
Oregon State University	2
New York State University College of Forestry at Syracuse University	2
Pennsylvania State University	11
Southern Illinois University	3
Southern Methodist University	1
S. P. College, Srinagar, India	1
Swiss Institute of Technology	1
Thiel College	2
Tokyo University	1
Taiwan University	1
University of Arizona	1
University of Cincinnati	1
University of Connecticut	1
University of Illinois	2
University of Indonesia	2
University of Maryland	1
University of Minnesota	2
University of Missouri	1
University of New Brunswick	1
University of North Carolina	1
University of Rhode Island	1
University of the South	2
University of Stellenbosch	1
Washington State University	1
William Jewell College	2
Yale University	6
Total	51

Geographical Distribution

UNITED STATES

Alabama	2
Arizona	2
Arkansas	5
Colorado	1
Connecticut	2
Florida	1
Indiana	2
Illinois	3
Louisiana	3
Maryland	5
Michigan	1
Missouri	1
Nebraska	1
New Hampshire	1
New Jersey	1
New York	5
North Carolina	15
Ohio	2
Oregon	1
Pennsylvania	10
South Carolina	2
Tennessee	6
Texas	2
Virginia	1
Washington	1
Wisconsin	2
Total States	26

FOREIGN COUNTRIES

Canada	1
China (Taiwan)	1
Holland	1
India	1
Indonesia	2
Japan	1
South Africa	1
Switzerland	1
Total	8

General Summary

Students in the School of Forestry	74
Students of Forestry in the Graduate School of Arts and Sciences	11
Total Enrollment	85
Total number of Institutions Represented	51
Total Number of States Represented	26
Total Number of Foreign Countries Represented	8

BULLETIN
OF
DUKE UNIVERSITY



Directory of the Officers, Faculty, and Staff

VOLUME 37 March, 1965 NUMBER 3-C

Annual Bulletins

For Bulletin of Information for Prospective Students, apply to *The Registrar,* Duke University, Durham, N. C., 27706.

For Bulletin of Undergraduate Instruction, apply to *The Registrar,* Duke University, Durham, N. C., 27706.

For Bulletin of Engineering, apply to *The Registrar,* Duke University, Durham, N. C., 27706.

For Bulletin on The Divinity School, apply to *The Dean of the Divinity School,* Duke University, Durham, N. C., 27706.

For Bulletin of The School of Forestry, apply to *The Dean of the School of Forestry,* Duke University, Durham, N. C., 27706.

For Bulletin of The Graduate School of Arts and Sciences, apply to *The Dean of the Graduate School,* Duke University, Durham, N. C., 27706.

For Bulletin of The School of Law, apply to *The Dean of the School of Law,* Duke University, Durham, N. C., 27706.

For Bulletin of The School of Medicine, apply to *The Dean of the School of Medicine,* Duke University, Durham, N. C., 27706.

For Bulletin of The School of Nursing, apply to *The Dean of the School of Nursing,* Duke University, Durham, N. C., 27706.

For Bulletin of The Summer Session, apply to *The Director of the Summer Session,* Duke University, Durham, N. C., 27706.

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BULLETIN

OF

DUKE UNIVERSITY

DIRECTORY

OF THE

OFFICERS, FACULTY, AND STAFF

DURHAM, NORTH CAROLINA
1965

Officers of the University for the Year 1964-65

The Corporation

THE UNIVERSITY TRUSTEES

(The date in parentheses indicates the year of election.)

Trustees whose term expires December 31, 1965

George Venable Allen (1961)	Washington, D. C.
A. Merrimon Cuninggim (1963)	St. Louis, Mo.
Benjamin Everett Jordan (1943)	Saxapahaw, N. C.
George Crews McGhee (1962)	Bonn, Germany
Marshall I. Pickens (1963)	Charlotte, N. C.
Henry Gibbons Ruark (1962)	Rocky Mount, N. C.
Walter McGowan Upchurch, Jr. (1964)	New York, N. Y.
Charles Byrd Wade, Jr. (1964)	Winston-Salem, N. C.

From the Alumni

Thomas A. Aldridge (1959)	Naples, Fla.
Kenneth Millikan Brim (1952), *Vice Chairman*	Greensboro, N. C.
Edgar Harrison Nease (1950)	Winston-Salem, N. C.
George Robert Wallace (1954)	Morehead City, N. C.

Trustees whose term expires December 31, 1967

Calvin Bryan Houck (1951)	Roanoke, Va.
Edwin Lee Jones (1945)	Charlotte, N. C.
Ben Neely Miller, Jr. (1958)	Columbia, S. C.
Frank Odell Sherrill (1959)	Charlotte, N. C.
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Professor of Medical Art and Illustration — 801 West Maynard Avenue

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BULLETIN

of

Duke University

COURSES IN DIVINITY SCHOOL

DUKE UNIVERSITY SUMMER SESSION

1965

DURHAM, NORTH CAROLINA

First Term: June 12—July 17

Second Term: July 19—Aug. 24

Volume 37 January, 1965 *Number 3-C*

Calendar of the Summer Session 1965

June 11—Friday, 12 o'clock noon.
Dormitory rooms ready for occupancy

June 12—Saturday
Registration for the First Term in Central Records Office, 103 Allen Building, 8:30 A.M.-1:00 P.M.

June 14—Monday
Instruction begins for First Term

July 16-17—Friday-Saturday
Final examinations for First Term

July 19—Monday, 8:30-1:00
Registration for Second Term

July 20—Tuesday
Instruction begins for Second Term

August 23-24—Monday-Tuesday
Final examinations for Second Term

All classes meet six days a week—Monday through Saturday. Classes will not meet, however, Saturday, July 3; Saturday, July 31; and Saturday, August 14.

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HARMON L. SMITH, (1962) B.D., Ph.D.
Assistant Professor of Christian Ethics

Duke University Summer Session

THERE will be two terms of the Duke University Summer Session of 1965. The first term will begin on June 12 and end on July 17. The second term will begin on July 19 and end on August 24.

Courses in religion and related fields will be offered in the Duke University Summer Session. These courses are subject to all the regulations of the Duke University Summer Session as published in the Summer Session Bulletin. The undergraduate credits secured will count on the Bachelor of Arts degree. Divinity School credits will count on the Bachelor of Divinity, Master of Theology, and Master of Religious Education degrees. Graduate School credits will count on the Master of Arts and Doctor of Philosophy degrees. These credits may, of course, be transferred to other colleges, universities, and theological schools in the same way that such transfer of credit is usually made.

Candidates for degrees from Duke University shall be formally admitted to the school which will confer the degree. Candidates for the B.D. and M.R.E. degrees must be admitted to the Divinity School; candidates for the A.M. and. Ph.D. degrees must be admitted to the Graduate School of Arts and Sciences.

Pre-Enrollment

Students in residence at Duke University during the spring semester 1965 who plan to enroll for courses offered in the 1965 Summer Session will pre-enroll on the following dates:

The Divinity School
April 15-16

Students not in residence may pre-enroll by mail. Request for application blank should be made to the Summer Session Office, Duke University. Completed applications should be mailed to the Dean of the Divinity School, Duke University.

Registration

Students in residence who have pre-enrolled on April 15 and 16 may complete their registration in the Summer Session Office on May

10-June 5. Advance registration in the Summer Session Office includes:

1. Completion of various Summer Session forms.
2. Payment of University fees.

Students not in residence at Duke University during the spring semester of 1965 whose applications are approved by the Dean of the Divinity School may complete registration by mail through June 5. Advance registration by mail with the Summer Session Office includes:

1. Completion in full and return of forms required by the Summer Session Office by June 5.
2. Payment of University fees by June 5.

Students who complete registration with the Summer Session Office on or before June 5 need not be present at the general registration on June 12. They will meet classes on June 14.

All Summer Session students whose classes begin on June 14, Term I, who *do not* complete registration in the Summer Session Office on or before June 5 *must* present themselves at general registration in Central Records Office, 103 Allen Building, on June 12 to register.

Any student who fails to register on or before June 12, Term I, July 19, Term II, will be charged a fee of $5.00 for late registration.

All changes in courses other than those required by the University will require a payment of $1.00 for each change made.

Fees and Expenses

The University fee is as follows:

Covering registration, tuition and medical care $35.00 per semester hour.

One half of the above fee is rebated to students enrolled in the Divinity School, who will pay $17.50 per semester hour.

Applications for admission may be obtained from either the Divinity School Office or the Summer Session Office.

Room and Board

In all dormitories the rate of room rent is $35.00, per term, for each student, where two students occupy a room. Single rooms are available at the rate of $41.25 for each term, but in limited numbers. Graduate and undergraduate students will be assigned to separate residence halls in so far as is possible. The Divinity School and

Housing Bureau will be glad to assist married students in locating accommodations for themselves and their families off the campus. Occupants of the University rooms furnish their own bed linen, blankets, pillows, and towels. Applications for rooms should be made to the Housing Bureau.

Board will be provided in the University cafeteria at approximately $72.00 for each term depending upon the needs and tastes of the individual.

Advanced Degrees

The degrees of Bachelor of Divinity, Master of Theology, and Master of Religious Education are offered in the Divinity School.

The degrees offered in the Graduate School of Arts and Sciences are Master of Arts and Doctor of Philosophy.

Graduate study in religion leading to the degrees of Master of Arts and Doctor of Philosophy may be pursued in three fields: (1) Biblical Studies; (2) Studies in Church History; and (3) Studies in Christian Theology and Ethics.

Candidates for advanced degrees must be graduates of colleges of recognized standing.

Upon request the Director of the Summer Session or the Dean of the Divinity School will furnish bulletins containing detailed description of the academic requirements for the degrees of Bachelor of Divinity, Master of Theology, Master of Religious Education, Master of Arts, and Doctor of Philosophy.

Religious Services

University religious services are held each Sunday morning at 9:30 o'clock in the University Chapel. All students are cordially invited to attend.

The Summer Session of the Divinity School

Summer, 1965

Class enrollments will be controlled as occasion may arise so as to secure a fairly even distribution among the courses offered in each term.

FIRST TERM: (Registration June 12—Classes begin June 14 and end July 17)

115 (DS). MORAL THEOLOGY IN THE TWENTIETH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of William Temple and selected contemporary theologians. 11:00-12:20. 3 s.h. HARMON SMITH

195 (DS). ORIGINS OF DOGMATIC THOUGHT.—An analysis of dogmatic concepts in the Gospel of John: their development into a body of doctrine. 7:40-9:00. 3 s.h. HERZOG

261 (DS). THE THEOLOGY OF JOHN WESLEY.—A study of the development and structure of Wesley's theology, with special reference to his doctrines of man and salvation. 9:20-10:40. 3 s.h. RICHEY

SECOND TERM: (Registration July 19—Classes begin July 20 and end August 24)

16 (DS). CONTEMPORARY WESTERN CULTURE.—An analysis of the conceptual commitments in contemporary styles of thought and life as reflected in the natural sciences, philosophy, social analysis, and the arts. 9:20-10:40. 3 s.h. POTEAT

140 (DS). THE RISE OF METHODISM AND THE ANGLICAN BACKGROUND.—The Methodist societies within the Church of England to the death of Wesley. 11:00-12:20. 3 s.h. BAKER

170 (DS). INTRODUCTION TO PASTORAL COUNSELING.—The philosophy and techniques of formal counseling through discussions of textual and interview material. 7:40-9:00. 3 s.h. GOODLING

SUMMER CLINICS

Three Clinics, Preaching, Pastoral Care, and Rural Church Work will be held simultaneously, July 19-30, 1965.

Costs: Registration Fee, $10. Tuition, $40. Board & Room.

All participants are eligible for Tuition Grants. In addition, Methodist Ministers in North Carolina may inquire about special grants provided by agencies of the Annual Conferences to cover costs.

Registration is open to ministers of all denominations.

No academic credit is given.

PREACHING: This is the eighth Clinic in Preaching to be held at Duke. Registration is limited to eighteen in number, preferably restricted to active ministers and chaplains who have been out of seminary five years or more. The clinic will concern itself mainly with principles of sermon construction and delivery, giving ample opportunity for the participants to preach for critique. Matters

of common concern for preachers will be discussed in plenary sessions. For registration information write to Professor Thor Hall, Director.

PASTORAL CARE: The Clinic in Pastoral Care has as its theme the psychological and theological dimensions of selfhood. Through lectures, discussions, hospital visitation, and verbatim conferences, aspects of the theme are explored: the meaning of selfhood, the self in crisis and the ministry of the Church to those caught in the crisis of illness, the action of God in the midst of suffering, and the personal and sacramental means of grace. Hospital visitation supervised by the Chaplains to the Duke Medical Center forms an integral part of the program. For registration information write to Professor Richard A. Goodling, Director.

RURAL CHURCH: The Rural Church Clinic will consist of intensive training, study, and planning in the area of the church's responsibilities in the town and country community, giving particular emphasis to the development of an indigenous leadership. For registration information write to Professor M. Wilson Nesbitt, Director.

The Methodist Course of Study School
July 12-August 6, 1965

William Arthur Kale, *Director,* John J. Rudin, II, *Associate Director*
Box 4353, Duke Station
Durham, North Carolina

The Methodist Course of Study School, the seventeenth session of the short term school for Methodist ministers taking the required Course of Study, will be conducted during the period, July 12-August 6, 1965. While this school is designed primarily for Supply Pastors and other non-seminary candidates for the Methodist ministry, clergymen of any denomination may enroll. The curriculum as approved by the 1960 Methodist General Conference will be followed, which will include Studies for License to Preach, Introductory Studies, and the Studies for the First, Second, Third, and Fourth Years.

In addition to class work, there is provision for daily worship in Duke Chapel and a number of special lectures and workshops. A varied program of recreation and athletics will be supervised by the University Department of Physical Education.

Registration is scheduled for July 12. Classes begin on the morning of July 13 and continue through August 6, including Saturdays. A descriptive folder giving details of the School will be ready for distribution about February 1, 1965, and copies may be procured by writing to Professor W. A. Kale, Director, Box 4353, Duke Station, Durham, N. C.

DUKE UNIVERSITY MARINE LABORATORY

Beaufort, North Carolina

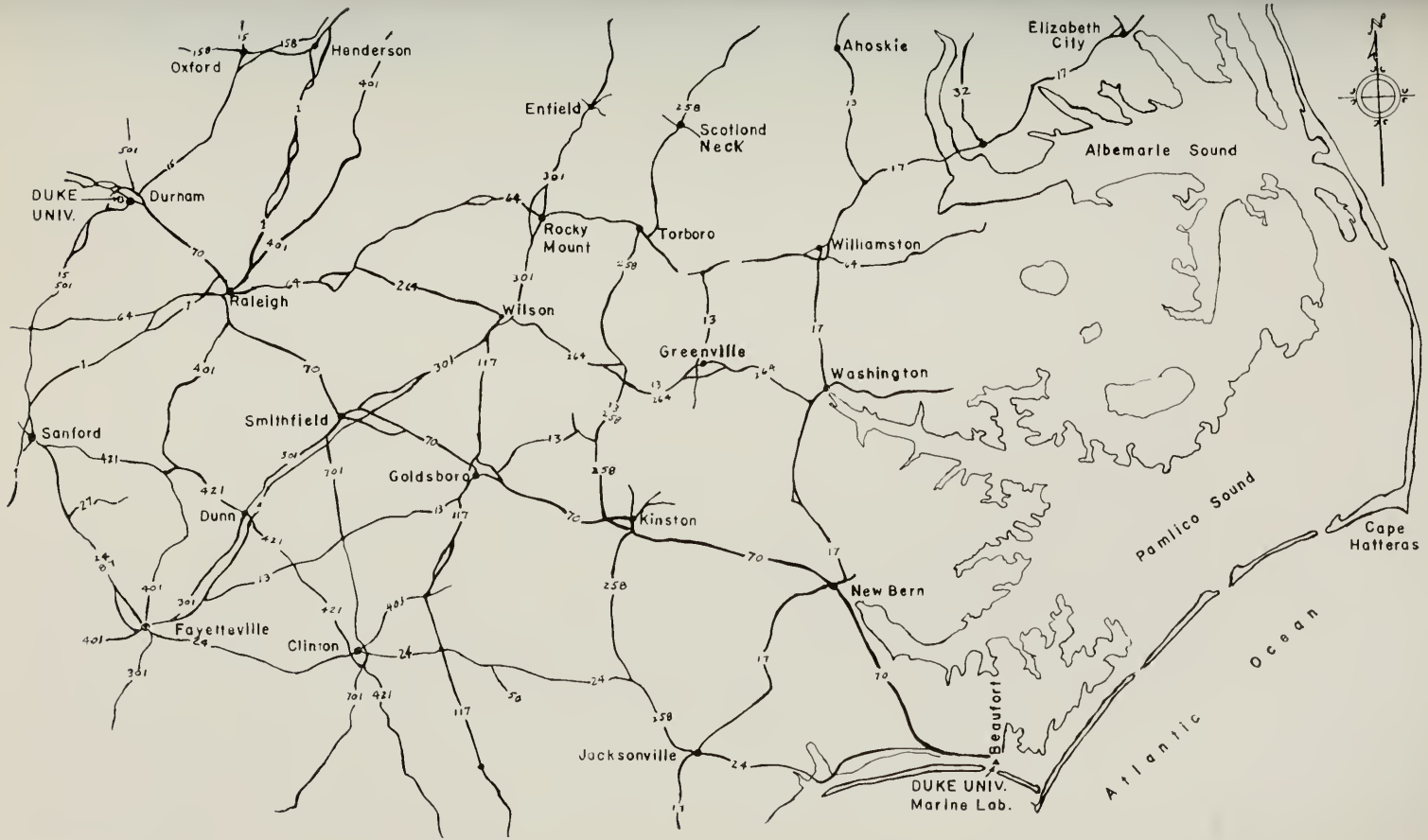


Announcement for Twenty-eighth Summer Session, 1965

Term I: June 12-July 17

Term II: July 19-Aug. 24

VOLUME 37 JANUARY, 1965 NO. 3-D


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Marine Lab.

Calendar for Summer Session, 1965 1
Administration and Laboratory Personnel 2
Introduction 4
Flora and Fauna 5
General Information 6
Research Facilities 7
Living Accommodations 8
Fees and Expenses 9
Awards 10
Application and Admission 11
Courses of Instruction 12
Lectures and Research Seminars 14
Publications 1963-64 16
Application Form 19

Calendar for Summer Session, 1965

Registration at Beaufort—Term I, Saturday, June 12

Term I—Instruction begins Monday, June 14

Term I—Holiday—Saturday, July 3

Term I ends Saturday, July 17

Registration at Beaufort—Term II, Monday, July 19

Term II—Instruction begins Tuesday, July 20

Term II—Holidays—Saturday, July 31 and Saturday, August 14

Term II ends Tuesday, August 24

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ADMINISTRATION AND

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Department of Biochemistry

Terry W. Johnson, Jr., Chairman
Department of Botany

Edward C. Horn, Chairman
Department of Zoology

Karl M. Wilbur
Department of Zoology

ADMINISTRATIVE STAFF

C. G. Boakhaut, Director
F. J. Vernberg, Assistant Director (on leave, 1965)
J. D. Costlow, Jr., Acting Assistant Director
R. M. Ely, Business Manager

COOPERATIVE OCEANOGRAPHIC PROGRAM

R. J. Menzies, Director
J. G. Newton, Marine Superintendent of the Oceanographic Operations
D. L. Beveridge, Master R/V EASTWARD

ACADEMIC STAFF

Robert Barnes, Ph.D. —Invertebrate zoology, Gettysburg College
C. G. Boakhaut, Ph.D. —Marine invertebrate embryology and invertebrate zoology
J. D. Costlow, Jr., Ph.D. —Marine invertebrate embryology and experimental zoology
I. E. Gray, Ph.D. —Marine ecology and entomology
Wanda S. Hunter, Ph.D. —Marine parasitology
T. W. Johnson, Jr., Ph.D. —Marine mycology
R. J. Menzies, Ph.D. —Biological oceanography, deep-sea fauna
John L. Roberts, Ph.D. —Physiological ecology, University of Massachusetts
Paul Silva, Ph.D. —Marine algae, University of California
Unnsteinn Stefansson, Ph.D. —General physical and chemical oceanography
F. J. Vernberg, Ph.D. —Physiological ecology of marine animals
Robert L. Wilbur, Ph.D. —Plant taxonomy

LABORATORY PERSONNEL

Research Associates
Academic Year

A. N. Sastry, Ph.D. —Effects of environmental factors on development and survival of larvae

George Schultz, Ph.D. —Antarctic deep-sea isopods

Winona B. Vernberg, Ph.D. —Influence of temperature on marine organisms

Visiting Investigators
Academic Year

John Day, Ph.D. —National Science Foundation Senior Foreign Scientist Fellow. The Beaufort transects

F. Harold McCutchean, Ph.D. —Experimental analysis of pressure sensitivity and swim bladder physiology in fish

Mohammad Tufail, Ph.D. —Fulbright Hayes Program. Development of crustacea in relation to environmental factors

Graduate Students Engaged in Thesis Research
Academic Year

Joann H. Allwein, A.B.
Richard Blanquet, B.S.
Richard Caldwell, B.S.
William Carr, B.S.
Frederick Grassle, B.S.
Judith Grassle, B.Sc.Hons.
June Harrigan, B.S.
Lawrence McCloskey, M.A.
Thomas Myers, A.B.
Joanne O'Connell, B.S.
David Schneider, A.B.
Mary Wirtensan, M.A.

Research Assistants
Academic Year

Marilyn Barnes, A.B.
Sally Herring
Doris King, A.B.
Paul Klein
Alene McCutcheon, B.S.
Shirley Midgett
Charlotte Schneider, A.B.
Berta Willis
Thomas Wittkamp, B.S.
Sandra Woods, Ph.D.

Technical Staff

Norris Hill, Maintenance Supervisor
Richard O. Thomas, M.A., Biological Laboratory Technician
Richard L. Wortham, B.S., Technical Draftsman
Craig Horne, Laboratory Technician
Mary Fond Janes, Secretary-Bookkeeper
E. Carolyn Ward, Secretary-Bookkeeper, Oceanographic Program
Estelle G. Merrell, Secretary
Brenda Nelson, Clerk-Typist
Thelma Ward, Clerk-Typist, Oceanographic Program
Jean S. Williams, Librarian
James Willis, Assistant Maintenance Supervisor
Clifton Davis, Laboratory Mechanic
Grayden I. Moore, Carpenter
Bernie Willis, Labaratory Mechanic

INTRODUCTION

Through the efforts of Dr. A. S. Pearse, the Duke University Marine Laboratory was founded in 1938 an Pivers Island near the town of Beaufort, North Carolina. It was established initially to offer training at the senior-graduate level, but soon research became an integral part of the program. Before 1949, when the first research laboratory was built, only a few investigators could be accommodated. Other research buildings were added in 1954, 1957, 1960, and 1964. The research laboratories and one modern dormitory are heated and air-conditioned; thus, the Marine Laboratory can offer favorable opportunities for year-round research. Studies are currently being conducted in the fields of ecology, systematics, physiology, parasitology, embryology, mycology, algology, and biological oceanography.

The Duke University Marine Laboratory presently occupies thirteen acres of the southern portion of Pivers Island; the U. S. Fish and Wildlife Laboratory encompasses the remainder of the island, the north end. The present plant consists of eighteen buildings including three dormitories capable of housing forty-six people, a large dining hall, two residences, boathouse, storehouse for ship's gear, classroom laboratories and five research buildings.

The station operates a 118-foot research vessel for oceanographic studies, a 55-foot trawler for off-shore investigations, and a 39-foot cabin power boat for trawling and dredging in the surrounding sounds and estuaries. A 27-foot outboard power boat, a 17-foot fiberglass boat, row boats, outboard motors, and collecting gear are also available.

The Laboratory maintains a well-equipped workshop and a stockroom of chemicals, glassware, supplies, and equipment.



The 55-Foot Trawler, "Beveridge"

FLORA AND FAUNA



The 39-Foot "Venus"

Beaufort is approximately midway between Woods Hole, Massachusetts, and Miami, Florida. It is in the southern range of many plants and animals which occur off the New England coast and in the northern range of species which are found off the Florida coast and in the West Indies. The edge of the Gulf Stream system is about 35 miles offshore, and between it and the shore are occasional reefs.

The Beaufort area is strategically located for biological research because of the richness of its flora and fauna, and the ease with which one may reach a variety of habitats. From the Laboratory, by boat or automobile it is easy to reach the ocean, Cape Lookout, and the Outer Banks, Bogue and Core Sounds, Harker's Island, rivers, creeks, canals, mud flats, sand beaches, dunes, marshes, peat bogs, cypress swamps, bird islands and rookeries, and coastal forests. Long leaf pine, yaupon, and at least seven species of insectivorous plants (protected by law), including the Venus flytrap, grow in the region. A great variety of algae, both freshwater and marine, is available. Common animals include the king crab, squid, shrimps, snails, clams, ctenophores, jellyfish, hydroids, sponges, polychaetes, sea urchins, starfish, brittle stars, sand dollars, many fishes, skimmers, terns, gulls, herons, sea turtles, and porpoises.

A check list of flora and fauna is available for a small service fee from the Director upon request.

GENERAL INFORMATION

Climate:

The Beaufort area is well known for its moderate climate during the summer. Air temperatures range from an average minimum of 70°F. to an average maximum of 86°F. There is a prevailing southwest breeze from the ocean during most of the summer. Water temperatures range from 22-29°C. in June and from 24-30°C. during August.

Clothing:

Students should bring clothes suitable for field work including a sun hat, tennis shoes, bathing suit, shorts, work gloves and sun glasses.

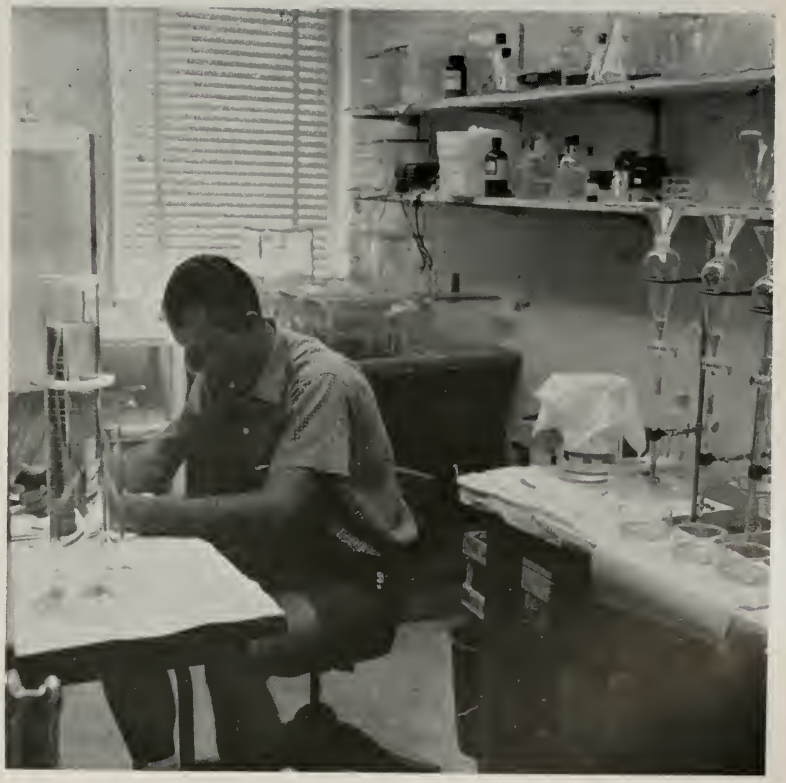
Recreation:

There are ample opportunities for recreation in and around Beaufort —swimming, fishing, boating, water-skiing, etc. On campus recreational facilities include swimming, diving, shuffle-board, horseshoe pitching, volleyball, croquet and table tennis.

Travel:

Pivers Island is only 150 yards across the channel from the town of Beaufort. A bridge leads to U. S. Highway 70, so that the Island is readily accessible by automobile. The only direct means of public transportation to Beaufort is by bus. Upon arrival at Beaufort, the Laboratory may be reached by taxi.

The closest airport is New Bern, North Carolina, a distance of 40 miles from Beaufort. It is served by Piedmont Airlines.



Research Cubicle

RESEARCH FACILITIES



Library

Laboratory Equipment and Supplies:

Visiting investigators may obtain research space throughout the year. Each research laboratory building is air-conditioned and equipped with running sea water through a hard rubber system. There are tanks, water tables, aquaria, autoclave, ovens, and plants presses. In addition to commonly used laboratory equipment, the following are available: two refrigerated centrifuges with multispeed attachments, Beckman DU spectrophotometer, balances, pH meters, hoods, and constant temperature equipment. Each person is expected to supply his own optical equipment or other special apparatus needed. A list of equipment, chemicals and glassware is available upon request. A darkroom and a small reference collection of marine algae and vascular flora are also maintained.

Oceanographic Research:

The 118-foot research vessel EASTWARD with a capacity for forty students on eight-haur cruises or faurteen students and staff on extended cruises is available.

During the present year the ship will operate on the Eastern Seaboard from Virginia to Florida and beyond the Continental Shelf. It is outfitted with modern recording and collecting devices, and is available to investigators and teachers of graduate courses in marine sciences and their students. Application for ship time must be made in advance. Address inquiries to Dr. R. J. Menzies, Oceanographic Program Directar, Duke University Marine Laboratory, Beaufort, North Carolina.

Collecting:

Spades, shovels, sieves, nets, and rowboats are provided without charge to assist the investigator in his collecting. Two boats are available for dredging and trawling, the 39-foot VENUS for $10.00 per hour and the 55-foot BEVERIDGE for $20.00 per hour.

Library:

The library contains over 6,100 cataloged reference books and journals, 105 current journals, and 9,100 reprints. A microfilm library of graduate student theses based on research at the Laboratory, a microfilm reader, and an Apeco copier are also available. The librarian may obtain other materials from the library on the main campus or through interlibrary loan service.

LIVING ACCOMMODATIONS

Dining Hall:

The dining hall at the Laboratory will be open from June 12 through August 24. The charge for full board in the dining hall is $17.50 per week or $87.50 for one term. This fee provides three meals per day, Monday through Saturday, and breakfast and noon dinner on Sunday. No credit will be allowed for meals that are missed.

Research personnel and their families residing off campus are cordially invited to eat at the Dining Hall. Arrangements may be made for all or occasional meals if sufficient notice is given at the business office of the Laboratory.

For individual meals the following rates will be in effect from June 12 through August 24:

Breakfast	$ .65
Lunch	.90
Dinner	1.25
Sunday Dinner	1.50

Children under twelve will be charged one-half the adult rate.

Dormitories:

The three dormitories will accommodate a total of forty-six people. Rent per person for one term with two occupants per room is $35.00. Occupants must supply their own linens, blankets and towels, but pillows will be furnished. **Dormitory rooms are not available without board** during the summer terms.

Fees for board and room are payable upon arrival at the Business Office of the Laboratory.

Beaufort Housing:

Rooms in the Beaufort area may be obtained for approximately $12.50 per week per person. Bed linens, pillows, and towels are supplied.

Furnished apartments may be rented for $45.00 per month and up.

FEES AND EXPENSES

Tuition Fees:

The University fee is $35.00 per semester hour for all except teachers in elementary and secondary schools, who will be charged $15.00 per semester hour. In addition there is a laboratory fee of $10.00.

Course fees for one term are as follows:

University fee - - - - - - - - - - -	$210.00
Laboratory fee - - - - - - - - - - -	10.00



Dormitory

The Director of the Summer Session, Duke University, Durham, North Carolina, will notify the applicant of course approval. The University and laboratory fees should then be paid promptly to the Director of the Summer Session to assure reservation in a course.

Research Space:

Limited research space is available for 1965. The rental fee for research areas is as follows:

Approx. Sq. Feet	Charge Per Month
80	$ 80.00
112	112.00
128	120.00
192	180.00
200	200.00
300	300.00

No additional charges are made for research assistants occupying the same research space as the investigators. Graduate students from institutions other than Duke University will be charged one-half the regular rate per person.

Inquiries and requests for space should be addressed to Dr. John D. Costlow, Jr., Acting Assistant Director, Duke University Marine Laboratory, Beaufort, North Carolina. Applications for the academic year are encouraged and will be acted upon shortly after they are received. All research applications for the summer of 1965 should be completed before March 10, 1965.

AWARDS

Predoctoral Awards:

For the summer of 1965 National Science Foundation predoctoral awards will be offered for research or for course work, including special problem research, at the Duke University Marine Laboratory. A basic award of $350 for a period of five weeks plus a limited travel allowance will be given. A tuition and laboratory fee of $220 is charged to persons holding awards.

A graduate student or teacher working toward an advanced degree at any university may apply. Selections will be based upon undergraduate and graduate transcripts and three letters of recommendation. Applications should be completed by March 10. Address inquiries to the Director, Duke University Marine Laboratory, Beaufort, North Carolina.

Postdoctoral Awards:

National Science Foundation postdoctoral awards of $1,800 are available for twelve weeks' research in Marine Biology at the Duke University Marine Laboratory. A limited travel allowance will also be given. A member of any academic or research institution, other than Duke University, may make application. The work may be carried out at any time during the year. Completed applications should be received by March 10. Address inquiries to the Director, Duke University Marine Laboratory, Beaufort, North Carolina.

Traineeships in Biological Oceanography:

Six 2-12 month graduate traineeships in biological oceanography are available for work from the R/V EASTWARD. Preference will be given to predoctoral students meeting the requirements, but Master candidates may also apply. Applicants may come from any accredited university in the United States.

Address all inquiries to Dr. Robert Menzies, Oceanographic Program Director, Duke University Marine Laboratory, Beaufort, N. C.

APPLICATION AND ADMISSION

All courses offered at the Laboratory are intended for graduate students and seniors. Admission is subject to the approval of the Instructor and the Director of the Laboratory. A course application form is provided on the back page of this bulletin. Upon completion, it should be sent to the Director of the Duke University Marine Laboratory, Beaufort, North Carolina, as early as possible and not later than March 10. Late applicants will be admitted if space permits. After acceptance, payment of tuition and laboratory fees is essential to assure reservation in a course.

High school teachers or college seniors should send a transcript of grades with the application blank. Students desiring a transfer of credit to their home institutions should request course approval form for transfer of credit from the Director of the Summer Session, Duke University, Durham, North Carolina. Students wishing to apply summer credits toward an advanced degree at Duke University must, in addition to filling in an application blank, register with the Duke University Graduate School. Students who have had adequate preparation and approval of their major professor may request space for independent or thesis research.

The last day of registration and suggested time of arrival for the first term is not later than 4:00 P.M., Saturday, June 12. Upon arrival students should report to the Laboratory Business Office for room assignments. Classes commence at 8:00 A.M., Monday, June 14. Second term personnel should report not later than 4:00 P.M., Monday, July 19. Classes commence at 8:00 A.M., Tuesday, July 20.

COURSES OF

FIRST TERM (June 12-July 17)

Botany 220. Coastal Field Botany.—A floristic survey of the regional flora with attention to the ecological associations of the Beaufort area. Daily field trips will provide the occasion for collection and intensive study of the rich vascular flora. **Prerequisite:** A year of college biology. 6 semester hours. MR. WILBUR

Zoology 203. Marine Ecology.—A study of marine animals in relation to environment. Consideration of environmental factors, succession, rhythms, communities, intraspecific and interspecific relations, productivity, conservation, problems, etc., concerned with animal life in the ocean. Lectures, reviews, conferences, field and laboratory work. 6 semester hours. MR. GRAY

Zoology 250. Physiological Ecology of Marine Animals.—A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla and from various habitats are studied. **Prerequisite:** Course in Physiology. 6 semester hours. MR. ROBERTS

Botany 225. Special Problems.—Hours to be arranged. Approval of instructor required. STAFF

Botany 359. Research.—Hours to be arranged. Approval of instructor required. STAFF

Zooiogy 353. Research.—Hours to be arranged. Approval of instructor required. STAFF

INSTRUCTION

SECOND TERM (July 19-August 24)

Botany 211. Marine Algae.—Classificotion, taxonamy, morphology, distribution, ecology, ond ecanomic uses of marine olgoe; preparotion of herbarium material. In addition to collection, field work will provide students on oppartunity to observe assaciations of marine algae. 6 semester hours. MR. SILVA

Zoology 215. General Physical and Chemical Oceanography.—Relief of the oceon floor; physical and chemical properties of seo woter; distributian of temperature, salinity, and density; heot budget; sea ice; light; ocean currents, waves ond tides; selected topics of regionol oceonography. —Field work, processing ond anolyzing of routine oceonogrophicol dota, solving problems ond interpretation of results. **Prerequisites:** One yeor of physics and chemistry, mothematics through colculus. 6 semester hours. MR. STEFANSSON

Zoology 274. Marine Invertebrate Zoalagy.—A study of invertebrate animols that occur in the Beoufart region. A number of field trips will be mode to a variety of habitots to study and to collect onimals in their notural environment. The structure and hobits of living invertebrotes, os well os their behoviar under experimentol conditions, will be studied in the laboratory. 6 semester hours. MR. BARNES

Botany 226. Special Problems.—Hours to be orranged. Approval of instructor required. STAFF

Botany 360. Research.—Haurs to be orronged. Approval of instructor required. STAFF

Zoalogy 354. Research.—Hours to be orronged. Approval of instructor required. STAFF

LECTURES AND

Evening Lectures:

During the summer of 1964 the following evening lectures were presented:

18 June Parasitic copepods as research animals. Dr. R. J. Shields, Department of Zoology, City College of New York.

25 June Carbohydrate metabolism in a shrimp. Dr. W. Dall, Department of Zoology, University of Queensland, Brisbane, Australia.

2 July Status of experimental research on influence of temperature on meristic structures in developing marine fishes. Dr. W. Fahy, University of North Carolina Institute of Fisheries Research.

9 July Radiobiological studies. Dr. T. R. Rice, Radiobiological Laboratory, Bureau of Commercial Fisheries.

23 July Morphological implications in systematics of marine fungi. Dr. T. W. Johnson, Jr., Department of Botany, Duke University.

6 Aug. Combining under-water photography and quantitative sampling. Dr. R. J. Menzies, Duke University Marine Laboratory.

13 Aug. Thermal acclimation in marine organisms. Dr. F. John Vernberg and Dr. Winona B. Vernberg. Duke University Marine Laboratory.

20 Aug. Electrolyte distribution and transport in the seaweed, **Gracilaria foliifera**. Dr. John Gutknecht, Radiobiological Laboratory, Bureau of Commercial Fisheries.

Research Seminar:

Investigators and students met Monday afternoons during the summer of 1964 to discuss current research being conducted at the Laboratory. The following research topics were presented:

15 June Commensal ciliate—echinoid interrelationships. Dr. Jacques Berger, Department of Zoology, North Carolina State College.

22 June Primitive contractility. Dr. Robert Rinaldi, Department of Zoology, University of Tennessee.

29 June Temperature adaptation in reproduction of some marine invertebrates. Dr. A. N. Sastry, Duke University Marine Laboratory.

RESEARCH SEMINARS

6 July — The mechanism of a marine gastropod praboscis. Dr. Anne Hurst, Friday Harbor Marine Laboratory.

13 July — Community evolution. Mr. Fred Grassle, Duke University Marine Laboratory.

20 July — Metabolic support of osmoregulation in euryhaline crustaceans. Dr. Fred Kalber, Department of Zoology, City College of New York.

27 July — Comparisans of egg shell formation in Platyhelminth parasites. Dr. William H. Cail, Department of Zoology, University of Kansas.

3 Aug. — Ecological factors influencing the geographic distribution of certain fiddler crabs. Mr. Dan C. Miller, Department of Biology, Queens College, New Yark.

10 Aug. — Studies on crustacean development. Dr. John D. Costlaw, Jr., Duke University Marine Laboratory.

Advanced Oceanography Seminar:

During the fall and spring semesters, 1964-65, the following topics have been or will be discussed by visiting scientists:

29 Sept. — Problems in Marine Microbiology. Dr. Carl Oppenheimer, Florida State University.

21 Oct. — Comparative temperature responses of Antarctic and temperate crustacea with reference to tissue metabolism and respiratian. Dr. Mary A. McWhinnie, DePaul University.

18 Nov. — Role of detritus in the oceans. Dr. Rezneat Darnell, Marquette University.

20 Jan. — Calcification in marine coccolithophorids. Dr. Miles Crenshaw, Forsyth Dental Center.

17 Feb. — Comparison of Limnology and Oceanography. Dr. Arthur D. Hasler, University of Wisconsin.

24 March — Research on diatoms. Dr. Ruth R. Patrick, The Academy of Natural Sciences of Philadelphia.

21 April — Evolution in the marine environment. Dr. John Day, University of Cape Town.

4 May — Speciation in bathypelagic fishes. Dr. Richard Rosenblatt, Scripps Institute of Oceanography.

PUBLICATIONS 1963-64

The publications listed below are the result of work done wholly or in part at the Duke University Marine Laboratory.

BOOKHOUT, C. G. 1964. Salinity effects on the larval development of **Pagurus bernhardus** (Linn) reared in the laboratory. Ophelia 1: 275-294.

BOOKHOUT, C. G., & F. J. VERNBERG. 1963. Duke University Marine Laboratory. Am. Zool. 3: 270-272.

CANDELAS, GUSTAVO A., & GRACIELA C. CANDELAS. 1963. Notes on the seasonal distribution of the sponge **Hymeniacidon heliophila** at Beaufort, North Carolina. Ecology 44: 595-597.

CERAME-VIVAS, M. J., AUSTIN B. WILLIAMS, & I. E. GRAY. 1963. New decapod crustacean records for the coast of North Carolina. Crustaceana 5: 157-159.

COSTLOW, J. D., JR. 1963. The effect of eyestalk extirpation on metamorphosis of megalops of the blue crab, **Callinectes sapidus** Rathbun. Gen. & Comp. Endocrinol. 3: 120-130.

COSTLOW, J. D., JR. 1963. Regeneration and metamorphosis in larvae of blue crab, **Callinectes sapidus** Rathbun. J. Exptl. Zool. 152: 219-228.

COSTLOW, J. D., JR. 1963. Molting and cyclic activity in chromatophorotropins of the central nervous system of the barnacle, **Balanus eburneus.** Biol. Bull. 124: 254-261.

COSTLOW, J. D., JR., & C. G. BOOKHOUT. 1964. An approach to the ecology of marine invertebrate larvae. Proceedings of Symposium on Experimental Marine Ecology. Occ. Publ. No. 2 Graduate School of Oceanography, University of Rhode Island. pp. 69-75.

CRISP, D. J., & J. D. COSTLOW, JR. 1963. The tolerance of developing cirripede embryos to salinity and temperature. Oikos 14: 22-34.

DARNELL, R. M. 1964. Organic detritus in relation to secondary production in aquatic communities. Proc. 15th Int. Congr. Theor. and Appli. Limnol. pp. 462-470.

GRAY, I. E., & M. J. CERAME-VIVAS. 1963. The circulation of surface waters in Raleigh Bay, North Carolina. Limnol. and Oceanog. 8: 330-337.

HEEZEN, B. C., R. J. MENZIES, E. D. SCHNEIDER, W. M. EWING, & N. C. L. GRANELLI. 1964. The Congo submarine canyon. Bull. Amer. Assoc. Pet. Geol. 48: 1126-1149.

HORN, EDWARD C., & MARILYN S. KERR. 1963. Hemolymph protein and copper concentrations of adult blue crabs (**Callinectes sapidus** Rathbun). Biol. Bull. 125: 499-507.

HUBSCHMAN, JERRY H. 1963. Development and function of neurosecretory sites in the eyestalks of larval **Palaemanetes** (Decapoda: Natantia). Biol. Bull. 125: 96-113.

HUMM, H. J., & M. J. CERAME-VIVAS. 1964. **Struvea pulcherrima** in North Carolina. J. Elisha Mitch. Sci. Soc. 80: 23-24.

JOHNSON, T. W., JR. 1963. Some aspects of morphology in marine Ascomycetes, **Halosphaeria** Linder. Nova Hedwigia 6: 67-81.

JOHNSTON, T. W., JR. 1963. Some aspects of morphology in marine Ascomycetes, **Carallospara** Werdermann. Nova Hedwigia 6: 83-93.

JOHNSON, T. W., JR. 1963. Some aspects of morphology in marine Ascomycetes, **Amylocarpus** Currey, **Herpatrichiella** Petrak and **Tarpedaspara** Meyers. Nova Hedwigia 6: 157-168.

JOHNSON, T. W., JR. 1963. Some aspects of morphology in marine Ascomycetes, **Ceriasparapsis** Linder. Nova Hedwigia 6: 169-178.

JOHNSON, T. W., JR., & A. R. CAVALIERE. 1963. Some aspects of morphology in marine Ascomycetes, **Remispara** Linder. Nova Hedwigia 6: 179-198.

LUM, SUSAN C., & C. S. HAMMEN. 1964. Ammonia excretion of **Lingula.** Comp. Biochem. and Physiol. 12: 185-190.

MANGUM, CHARLOTTE P. 1964. Studies of speciation in Maldanid polychaetes of the North American Atlantic coast. III. Intraspecific and interspecific divergence in oxygen consumption. Comp. Biochem. Physiol. 10: 335-350.

MANGUM, C. P. 1964. Activity patterns in metabolism and ecology of polychaetes. Comp. Biochem. Physiol. 11: 239-256.

MENZIES, R. J. 1963. General results of biological investigations on the deep-sea fauna made on the USNS Eltanin (USARP) during cruise 3 between Panama and Valparaiso, Chile, in 1962. Int. Revue Ges. Hydrobiol. 48: 185-200.

MENZIES, R. J. 1963. The abyssal fauna of the sea floor of the Arctic Ocean. Proceedings Arctic Basin Symposium. Arctic Inst. N.A., Tidewater Publ. Corp., Centerville, Md. pp. 46-66.

MENZIES, R. J. 1963. Abyssal Bryozoa collected by expeditions of the Lamont Geological Observatory 1. Bicellariellidae (Bugulidae of Authors), Kinetoskias. Novitates, No. 2130: 1-8.

MENZIES, R. J., K. O. EMERY, & LOGAN SMITH. 1963. A combined underwater camera and bottom grab: a new tool for investigation of deep-sea benthos. Int. Revue ges. Hydrobiol. 48: 529-545.

MENZIES, R. J. 1964. Improved techniques for benthic trawling at depths greater than 2000 meters. Biol. of the Antarctic Seas, Antarctic Research Series. Amer. Geophysiol. Union 1: 93-109.

MENZIES, R. J., & W. M. LAYTON, JR. 1963. A new species of monoplacophoran mollusc, **Neopilina (Neopilina) veleronis** from the slope of the Cedros Trench, Mexico. Ann. Mag. Nat. Hist. New Ser. 13: 401-406.

MENZIES, R. J., J. L. MOHR, & C. WAKEMAN. 1963. The seasonal settlement of wood-borers in Los Angeles, Long Beach Harbors. The Wasmann J. of Biol. 21: 97-119.

ROSS, A., M. J. CERAME-VIVAS, & L. R. McCLOSKY. 1964. New barnacle record for the coast of North Carolina. Crustaceana 7: 312-313.

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Physical Plant of Duke University Marine Laboratory

Application for Enrollment in the Duke University Summer Session

Director, The Summer Session
Duke University
Durham, North Carolina

Date.....

Dear Sir:

Please reserve a place for me in the following courses:

No. of Course	Title of Course
.....	.....
.....	.....
.....	.....

(Signed).....
(Please Print)

Street Address.....Rural Route, or P. O. Box.....

Post Office.....State.....

Check one of the following:

Undergraduate credits..... Graduate credits..... General (unclassified).....

Do you wish a room reserved for June 12-July 17.....; July 19-Aug. 24.....;

or from..... to.....?

If college student, give undergraduate class....., or year in

Graduate School..... What college or university.....

.....

Are you a full-time teacher?..... Where?.....

Colleges attended & degrees.....

.....

.....

Teaching position..... Total number of years teaching experience.....

Will your fees be paid by:

(a) Yourself?..... (b) Other?.....

Have you attended previous Summer Sessions at Duke? Yes..... Years..... No.....

APPROVED.....

BULLETIN
OF
DUKE UNIVERSITY



The Graduate School of Arts and Sciences

CATALOGUE FOR 1965-66

VOLUME 37 February, 1965 NUMBER 4

Annual Bulletins

For Bulletin of Information for Prospective Students, apply to *The Registrar,* Duke University, Durham, N. C.

For Bulletin of Undergraduate Instruction, apply to *The Registrar,* Duke University, Durham, N. C.

For Bulletin of The College of Engineering, apply to *The Registrar,* Duke University, Durham, N. C.

For Bulletin of The Divinity School, apply to *The Dean of the Divinity School,* Duke University, Durham, N. C.

For Bulletin of The School of Forestry, apply to *The Dean of the School of Forestry,* Duke University, Durham, N. C.

For Bulletin of The Graduate School of Arts and Sciences, apply to *The Dean of the Graduate School,* Duke University, Durham, N. C.

For Bulletin of The School of Law, apply to *The Dean of the School of Law,* Duke University, Durham, N. C.

For Bulletin of The School of Medicine, apply to *The Dean of the School of Medicine,* Duke University, Durham, N. C.

For Bulletin of The School of Nursing, apply to *The Dean of the School of Nursing,* Duke University, Durham, N. C.

For Bulletin of The Summer Session, apply to *The Director of the Summer Session,* Duke University, Durham, N. C.

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Name and Address of Managing Editor: Miss Carolyn Golding, Assistant to the Registrar, Duke University, Durham, North Carolina.

Owner: Duke University, Durham, North Carolina.

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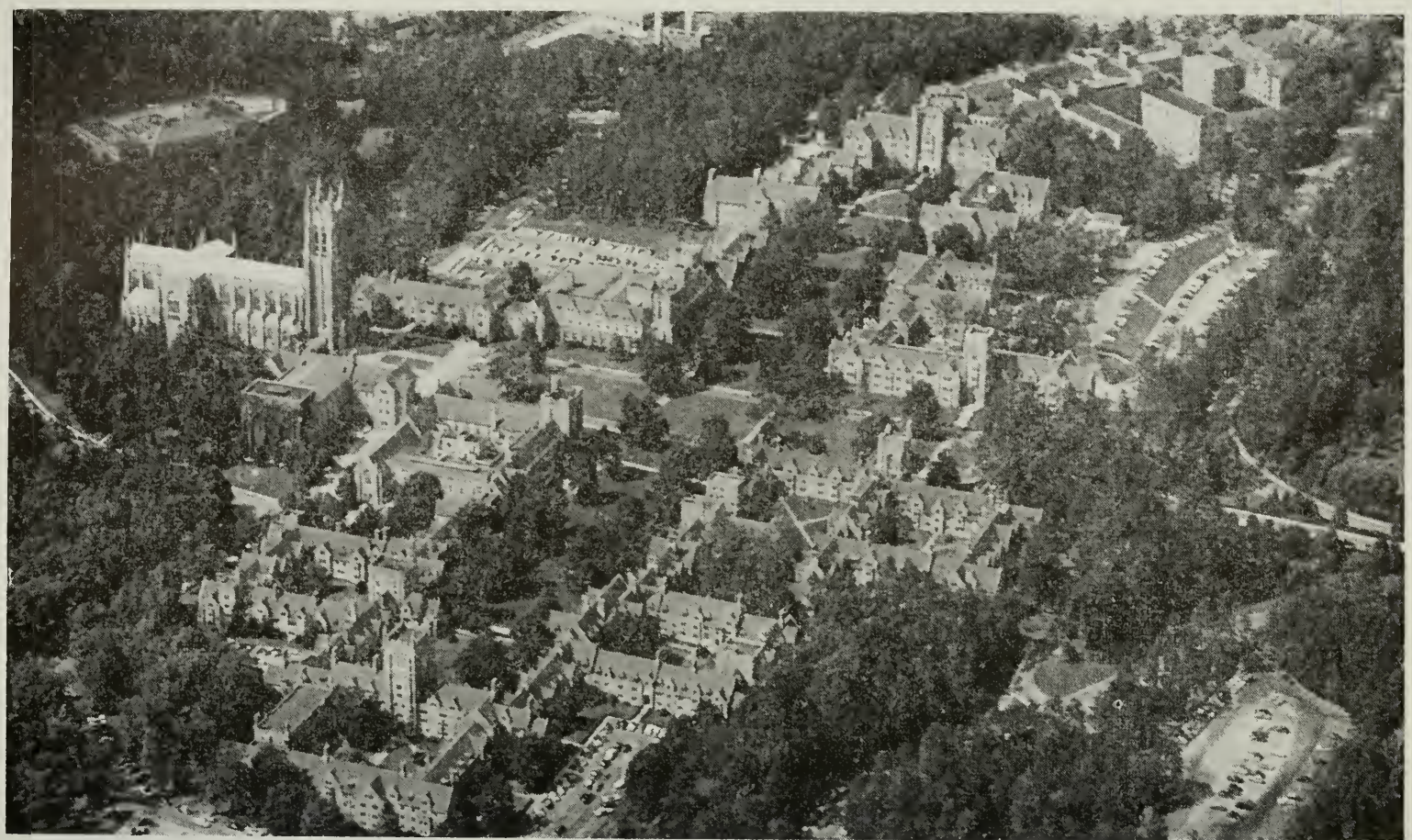
BULLETIN
OF
DUKE UNIVERSITY

THE GRADUATE SCHOOL
OF ARTS AND SCIENCES



1964-1965
CATALOGUE FOR 1965-1966

DURHAM, NORTH CAROLINA
1965



DUKE UNIVERSITY: WEST CAMPUS WITH DUKE FOREST IN BACKGROUND

Table of Contents

Calendar of the Graduate School 5

Officers of Administration 9

Instructional Staff 10

General Regulations Governing Graduate Study 20
- Admission 20
- Registration 23
- Grades, Hours, and Credits 23
- Language Requirements 27

Degrees Offered 30
- General Regulations Governing Master's Degrees 30
- Master of Arts 31
- Master of Science 33
- Master of Education 33
- Master of Arts in Teaching 34
- Master of Hospital Administration 36
- Doctor of Philosophy 36
- Doctor of Education 40

Awards and Fees 42
- Fellowships, Scholarships, and Assistantships 42
- Financial Regulations 45

Living Accommodations 46
- Housing 46
- Medical Care 47
- Motor Vehicles 48
- Student Activities 48
- University Counseling Service 48
- Appointments Office 49
- Estimated Expenses 49

Facilities for Graduate Study 50
- The Libraries 50
- Science Laboratories 52
- Engineering Laboratories 55
- Duke Forest 55
- Forest Sciences Laboratory 56
- Commonwealth-Studies Center 56
- Program in Comparative Studies on Southern Asia 57

Oak Ridge Institute of Nuclear Studies 58
Cooperative Programs with the University of North Carolina.. 59
Research and Publication 60
Visiting Scholars 61
Graduate Study in the Summer Session 62

COURSES OF INSTRUCTION 63
Anatomy 63
Art 64
Biochemistry and Nutrition 65
Botany 66
Chemistry 68
Classical Studies 70
Comparative Literature 70
Economics 71
Education 73
Engineering 78
English 83
Forestry 86
Geology 89
Germanic Languages and Literature 90
History 91
Hospital Administration 95
Mathematics 96
Microbiology and Immunology 98
Philosophy 100
Physics 102
Physiology and Pharmacology 104
Political Science 106
Psychology 109
Religion 112
Romance Languages 116
Russian 119
Sociology and Anthropology 119
Zoology 122
Program with Physical Therapy 124

ADVANCED DEGREES CONFERRED JUNE 1, 1964 125

ADVANCED DEGREES CONFERRED SEPTEMBER 1, 1964 128

HOLDERS OF FELLOWSHIPS, SCHOLARSHIPS, AND ASSISTANTSHIPS 130

Calendar of the Graduate School

Summer Session 1965

1965

April 6-9 Advance registration for current students for 1964 Summer Session (and for fall semester 1964).

June 12 Saturday—Registration of students for Summer Session, first term.

June 14 Monday—Instruction begins for Summer Session, first term.

June 24 Thursday—Final date for filing with the Graduate Office Statement of Intention to complete, during the first term, requirements for the Master's degree. If a thesis is to be presented, the title is to be filed at the same time as the Statement of Intention.

July 5 Monday—French and Spanish examinations for candidates for graduate degrees, 4:00 P.M., 233 Allen Building. Candidates register in the Graduate School Office not later than June 25.

July 5-9 German examination for candidates for graduate degrees. Candidates register in the Graduate School Office for these examinations not later than June 25.

July 17 Saturday—First term of Summer Session ends.

July 19 Monday—Registration of students for second term of Summer Session.

July 20 Tuesday—Instruction begins for second term of Summer Session.

July 23 Friday—Final date for filing with the Graduate Office Statement of Intention to complete, during the second term, requirements for the Master's degree. If a thesis is to be presented, the title is to be filed at the same time as the Statement of Intention.

Aug. 7 Saturday—ETS language examinations in French, German, and Russian, 125 Engineering Bldg. 9:00 A.M.; registration at University Counseling Center through July 6, fee $8.

Aug. 16 Monday—Last day for submitting theses for Master's degree.

Aug. 24 Tuesday—Second term of Summer Session ends.

Academic Year 1965-66

Sept. 20 Monday—Reading, Vocabulary and Grammar Tests in French, Spanish, and German: French and Spanish 9:00 A.M., German 10:15 A.M., both in 125 Engineering Building. (See page 27 for information.)
English Tests for Foreign Students: 2:00 P.M., 125 Engineering Building.
Consultation with Directors of Graduate Study concerning course program.

Sept. 21 Tuesday—Approval of course program and arrangement of fees for all new and non-pre-registered returning students. Graduate School Office, 127 Allen, 9-12; 2-3:30 P.M.

Sept. 22 Wednesday—Registration of graduate students for first semester. Indoor Stadium.

Sept. 23 Thursday—Classes begin.

Sept. 27 Monday—French and Spanish examination for candidates for prelims and for graduate degrees, 4:00 P.M., Room 125 Engineering Building.

Candidates register in the Graduate School Office for these examinations not later than September 1.

Oct. 11-15 German examinations for candidates for graduate degrees. Candidates register in the Graduate School Office for these examinations not later than October 1.

Oct. 30 Saturday—ETS language examinations in French, German, and Russian; registration at University Counseling Center through September 27, fee $8.

Nov. 24 Wednesday, 12:30 P.M.—Thanksgiving recess begins.

Nov. 29 Monday, 8:00 A.M.—Classes are resumed.

Dec. 11 Saturday—Founders Day.

Dec. 18 Saturday, 12:30 P.M.—Christmas recess begins.

1966

Jan. 3 Monday, 8:00 A.M.—Classes are resumed.

Jan. 7 Friday—French and Spanish examination for candidates for graduate degrees, 4:00 P.M., 125 Engineering. Candidates register in the Graduate School Office for these examinations not later than December 18, 1965.

Jan. 10-17 Reading period.

Jan. 18 Tuesday—Final examinations begin.

Jan. 22 Saturday—ETS language examinations in French, German, and Russian; registration at University Counseling Center through December 20, fee $8.

Jan. 28 Friday—Final examinations end.

Jan. 31 Monday—Reading, Vocabulary and Grammar Tests in French, Spanish and German for entering students, second semester. French and Spanish 10:30 A.M., German, 11:45 A.M., both in 125 Engineering Building. (See page 27 for information.)

Feb. 2 Wednesday—Registration for students not in residence during first semester and for current students who failed to pre-register. Indoor Stadium.

Feb. 3 Thursday—Classes are resumed.

Feb. 15 Last day for applying for University fellowships, graduate assistantships, and graduate scholarships.

March 1 Final date for filing with Graduate Office Statement of Intention of receiving advanced degree in June. Titles of theses and dissertations are to be filed concurrently with the Statement of Intention.

March 26 Saturday, 5:00 P.M.—Spring recess begins.

April 4 Monday, 8:00 A.M.—Classes are resumed.

April 8 Friday—French and Spanish examinations for candidates for graduate degrees, 4:00 P.M., 229 Allen. Candidates register in the Graduate School Office for these examinations not later than March 25.

April 15 Friday—Last day for submitting theses for degrees of Doctor of Philosophy and Doctor of Education.

April 16 Saturday—ETS language examinations in French, German, and Russian; registration at University Counseling Center through March 7, fee $8.

May 1 Saturday—Last day for submitting theses for degrees of Master of Arts, Master of Science, Master of Education, and Master of Arts in Teaching.

May 2-6 German examinations for candidates for graduate degrees. Candidates register in the Graduate School Office for these examinations not later than April 22.

May	14-21	Reading period.
May	21	Saturday—Final examinations begin.
June	1	Wednesday—Final examinations end.
June	4	Saturday—Commencement begins.
June	5	Sunday—Commencement sermon.
June	6	Monday—Graduating Exercises.

LAST DATES FOR APPLYING FOR ADMISSION

Fall Semester, with Award	February 15
Fall Semester, Admission Only	August 1
Spring Semester	January 1
Summer Session, First Term	May 14
Summer Session, Second Term	June 20

1965

JULY

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Officers of the University Administration

Douglas Maitland Knight, Ph.D., LL.D., Litt.D., *President of the University*
Robert Taylor Cole, Ph.D., *Provost*
Gerhard Chester Henricksen, M.A., C.P.A., *Vice President for Business and Finance*
Treasurer
Everett Harold Hopkins, M.A., LL.D., *Vice President for Planning and Institutional Studies*
Assistant Provost
Frank Leon Ashmore, A.B., *Vice President for Institutional Planning*
Charles Edward Jordan, A.B., LL.D., *Vice President for University Relations*
Frank Traver deVyver, Ph.D., *Vice Provost*
Harold Walter Lewis, Ph.D., *Vice Provost, Dean of Arts and Sciences*
Barnes Woodhall, M.D., *Vice Provost*
Benjamin Edward Powell, Ph.D., *Librarian*
Richard Lovejoy Tuthill, Ed.D., *University Registrar*
Craufurd David Goodwin, Ph.D., *Secretary*
Edwin Constant Bryson, LL.B., *University Counsel*

Graduate School Administration

Richard Lionel Predmore, D.M.L., *Dean of the Graduate School of Arts and Sciences*
Francis Ezra Bowman, Ph.D., *Secretary of the Graduate Faculty, Associate Dean and Director of Admissions, Graduate School of Arts and Sciences*
David V. Martin, Ed.D., *Assistant to the Dean*

EXECUTIVE COMMITTEE OF THE GRADUATE FACULTY

Kurt Back
Francis E. Bowman
C. K. Bradsher
R. L. Predmore
R. S. Smith*
Lionel Stevenson*
Dan C. Tosteson*
Paul Welsh

* Term ends September, 1965.

Instructional Staff

MEMBERS OF THE GRADUATE SCHOOL FACULTY
(as of November 1, 1964)

The date denotes the first year of service at Duke University

Frances Dorothy Acomb, (1945) Ph.D., *Associate Professor of History*
Donald Keith Adams, (1931) Ph.D., *Professor of Psychology*
John Richard Alden, (1955) Ph.D., *James B. Duke Professor of History*
Irving Alexander, (1963) Ph.D., *Professor of Psychology*
John C. Altrocchi, (1957) Ph.D., *Associate Professor of Psychology*
D. Bernhard Amos, (1962) M.D., *Professor of Immunology*
Hugh Anderson, (1957) Ph.D., *Professor of Biblical Criticism and Theology*
Lewis Edward Anderson, (1936) Ph.D., *Professor of Botany*
Roger Fabian Anderson, (1950) Ph.D., *Professor of Forest Entomology*
John Leslie Artley, (1955) D.Eng., *Associate Professor of Electrical Engineering*
Seymour Axelrod, (1958) Ph.D., *Lecturer in Psychology*
Kurt W. Back, (1959) Ph.D., *Professor of Sociology*
Joseph Randle Bailey, (1946) Ph.D., *Associate Professor of Zoology*
Frank Baker, (1960) Ph.D., *Associate Professor of Religion*
M. Margaret Ball, (1963) Ph.D., *Professor of Political Science*
Katherine May Banham, (1946) Ph.D., *Associate Professor of Psychology*
Furman Wyche Barton, (1964) Ph.D., *Assistant Professor of Civil Engineering*
†Paull Franklin Baum, (1922) Ph.D., *James B. Duke Professor Emeritus of English*
¶¶Charles A. Baylis, (1952) Ph.D., *Professor of Philosophy*
William Waldo Beach, (1946) B.D., Ph.D., *Professor of Christian Ethics*
Joseph Willis Beard, (1937) M.D., *Associate Professor of Virology*
Roland Frederick Becker, (1951) Ph.D., *Associate Professor of Anatomy*
Burton Beers, (1962) Ph.D., *Visiting Associate Professor of History*
Frederick Bernheim, (1930) Ph.D., *James B. Duke Professor of Pharmacology*
Mrs. Mary L. C. Bernheim, (1930) Ph.D., *Associate Professor of Biochemistry*
††Merle M. Bevington, (1942) Ph.D., *Professor of English*
L. C. Biedenharn, Jr., (1961) Ph.D., *Professor of Physics*
Lucius Aurelius Bigelow, (1929) Ph.D., *Professor Emeritus of Chemistry*
William Dwight Billings, (1952) Ph.D., *Professor of Botany*
***Edward Georges Bilpuch, (1962) Ph.D., *Assistant Professor of Physics*
Robert W. Binkley, (1957) Ph.D., *Assistant Professor of Philosophy*
Martin Lee Black, Jr., (1930) M.B.A., C.P.A., *Professor of Accounting*
John O. Blackburn, (1959) Ph.D., *Associate Professor of Economics*
Hugo Leander Blomquist, (1920) Ph.D., *Professor Emeritus of Botany*
J. J. Blum, (1962) Ph.D., *Associate Professor of Physiology*

*** Absent on Sabbatical Leave, 1964-65.
† Died July 15, 1964.
†† Died August 16, 1964.
¶¶ Absent on Sabbatical Leave, 1965-66.

Edward Claude Bolmeier, (1948) Ph.D., *Professor of Education*
Charles Alan Boneau, (1957) Ph.D., *Associate Professor of Psychology*
Cazlyn Green Bookout, (1935) Ph.D., *Professor of Zoology*
Lloyd J. Borstelmann, (1953) Ph.D., *Associate Professor of Psychology*
Francis Ezra Bowman, (1945) Ph.D., *Professor of English*
Benjamin Boyce, (1950) Ph.D., *Professor of English*
Thomas Allen Boyle, Jr., (1957) M.S. in M.E., *Associate Professor of Mechanical Engineering*
Charles Kilgo Bradsher, (1939) Ph.D., *Professor of Chemistry*
**Ralph Braibanti, (1953) Ph.D., *Professor of Political Science*
Jack Brehm, (1958) Ph.D., *Associate Professor of Psychology*
Edgar H. Brooks, (1963) Ph.D., *Visiting Professor of Political Science*
Earl Ivan Brown, (1960) Ph.D., *J. A. Jones Professor of Civil Engineering*
*Frances Campbell Brown, (1931) Ph.D., *Professor of Chemistry*
Edward H. Bryan, (1960) Ph.D., *Professor of Civil Engineering*
Marion R. Bryson, (1962) Ph.D., *Assistant Professor of Mathematics*
§Louis J. Budd, (1952) Ph.D., *Associate Professor of English*
Donald S. Burdick, (1962) Ph.D., *Assistant Professor of Mathematics*
Robert Mercer Burger, (1962) Ph.D., *Adjunct Associate Professor of Electrical Engineering*
William S. Bush, (1962) Ph.D., *Assistant Professor of Romance Languages*
Gale H. Buzzard, (1964) M.S., *Assistant Professor of Mechanical Engineering*
William Lawrence Byrne, (1954) Ph.D., *Associate Professor of Biochemistry*
Leonard Carlitz, (1932) Ph.D., *James B. Duke Professor of Mathematics*
Robert C. Carson, (1960) Ph.D., *Associate Professor of Psychology*
William H. Cartwright, (1951) Ph.D., *Professor of Education*
Juan R. Castellano, (1947) D.F.L., *Professor of Romance Languages*
**Clifton C. Cherpack, (1958) Ph.D., *Professor of Romance Languages*
Benjamin Guy Childs, (1924) M.A., *Professor Emeritus of Education*
C. Manning Clark, (1963) Ph.D., *Visiting Professor of History*
Kenneth Willis Clark, (1931) Ph.D., *Professor of New Testament*
Romane Lewis Clark, (1953) Ph.D., *Professor of Philosophy*
Sanford I. Cohen, (1957) M.D., *Assistant Professor of Psychology*
Robert Taylor Cole, (1935) Ph.D., *James B. Duke Professor of Political Science*
Joel G. Colton, (1947) Ph.D., *Professor of History*
Robert Merle Colver, (1953) Ed.D., *Associate Professor of Education*
Norman Francis Conant, (1935) Ph.D., *James B. Duke Professor of Microbiology*
Robert Howe Connery, (1949) Ph.D., *Professor of Political Science*
Thomas Howard Cordle, (1950) Ph.D., *Associate Professor of Romance Languages*
John Costlow, (1959) Ph.D., *Assistant Professor of Zoology*
Frederick A. G. Cowper, (1918) Ph.D., *Professor Emeritus of Romance Languages*
Robert I. Crane, (1961) Ph.D., *Professor of History*
Herbert F. Crovitz, (1961) Ph.D., *Lecturer in Psychology*
William L. Culberson, (1955) Ph.D., *Associate Professor of Botany*
John Shelton Curtiss, (1945) Ph.D., *Professor of History*
Robert Earle Cushman, (1945) B.D., Ph.D., *Professor of Systematic Theology*
Bingham Dai, (1943) Ph.D., *Professor of Psychology*

* Absent on Sabbatical Leave, Fall Semester, 1964.
** Absent on Leave, Spring Semester, 1965.
§ Absent on Sabbatical Leave, Fall Semester, 1965.

Eugene A. Davidson, (1958) Ph.D., *Associate Professor of Biochemistry*
David G. Davies, (1961) Ph.D., *Associate Professor of Economics*
Calvin De Armand Davis, (1962) Ph.D., *Associate Professor of History*
Gifford Davis, (1930) Ph.D., *Professor of Romance Languages*
Eugene Davis Day, (1962) Ph.D., *Associate Professor of Immunology*
Louis De Alessi, (1961) Ph.D., *Assistant Professor of Economics*
††David W. Dean, (1961) Ph.D., *Assistant Professor of Mathematics*
Herbert Deinert, (1962) Ph.D., *Assistant Professor of German*
William E. DeTurk, (1955) Ph.D., *Assistant Professor of Physiology and Pharmacology*
Frank Traver deVyver, (1935) Ph.D., *Professor of Economics*
§§§Irving Diamond, (1958) Ph.D., *Professor of Psychology*
Neal Dow, (1934) Ph.D., *Professor of Romance Languages*
Francis George Dressel, (1929) Ph.D., *Professor of Mathematics*
Bernard Duffey, (1960) Ph.D., *Professor of English*
Kenneth Lindsay Duke, (1940) Ph.D., *Associate Professor of Anatomy*
¶¶Robert F. Durden, (1952) Ph.D., *Associate Professor of History*
George Sharp Eadie, (1930) Ph.D., *Professor Emeritus of Physiology and Pharmacology*
Howard Easley, (1930) Ph.D., *Associate Professor Emeritus of Education*
Newton Edwards, (1961) Ph.D., *Visiting Professor Emeritus of Education*
Carl Eisdorfer, (1956) Ph.D., *Lecturer in Psychology*
William Whitfield Elliott, (1925) Ph.D., *Professor of Mathematics*
Ernest Elsevier, (1950) M.S. in M.E., *Associate Professor of Mechanical Engineering*
R. P. Erickson, (1961) Ph.D., *Assistant Professor of Psychology*
Lawrence Evans, (1963) Ph.D., *Assistant Professor of Physics*
Edwin Vaughan Evarts, (1961) M.D., *Associate Professor of Physiology*
John Wendell Everett, (1932) Ph.D., *Professor of Anatomy*
Henry A. Fairbank, (1961) Ph.D., *Professor of Physics*
John Morton Fein, (1950) Ph.D., *Professor of Romance Languages*
Arthur Bowles Ferguson, (1939) Ph.D., *Professor of History*
Charles E. Ferguson, (1957) Ph.D., *Professor of Economics*
Oliver Ferguson, (1957) Ph.D., *Associate Professor of English*
Donald J. Fluke, (1957) Ph.D., *Associate Professor of Zoology*
Earle Fowler, (1962) Ph.D., *Professor of Physics*
Charles H. Frenzel, (1955) A.B., *Professor of Hospital Administration*
Irwin Fridovich, (1958) Ph.D., *Assistant Professor of Biochemistry*
Mercedes Gaffron, (1958) M.D., Ph.D., *Associate Professor of Psychology*
Thomas M. Gallie, Jr., (1954-55; 1956) Ph.D., *Associate Professor of Mathematics*
Ila Gehman, (1959) Ed.D., *Lecturer in Psychology*
W. Scott Gehman, Jr., (1954) Ph.D., *Associate Professor of Psychology in Education*
Rhett Truesdale George, Jr., (1957) M.S.E.E., *Assistant Professor of Electrical Engineering*
John Jay Gergen, (1936) Ph.D., *Professor of Mathematics*
***Hans Gerhard, (1959) Ph.D., *Associate Professor of Economics*

*** Absent on Sabbatical Leave, 1964-65.
†† Resigned, August 31, 1964.
§§§ Absent on Leave, Spring Semester, 1965.
¶¶ Absent on Sabbatical Leave, 1965-66.

Allan H. Gilbert, (1920) Ph.D., *Professor Emeritus of English*
Donald G. Gillin, (1959) Ph.D., *Assistant Professor of History*
Sherwood Githens, (1962) Ph.D., *Professor of Science Education*
Clarence Gohdes, (1930) Ph.D., *James B. Duke Professor of English*
Craufurd Goodwin, (1962) Ph.D., *Assistant Professor of Economics*
Walter Gordy, (1946) Ph.D., LL.D., D.H.C., *James B. Duke Professor of Physics*
Richard Babson Grant, (1952) Ph.D., *Associate Professor of Romance Languages*
Irving Emery Gray, (1930) Ph.D., *Professor of Zoology*
Ronald C. Greene, (1958) Ph.D., *Assistant Professor of Biochemistry*
John R. Gregg, (1957) Ph.D., *Professor of Zoology*
Eugene Grueling, (1948) Ph.D., *Professor of Physics*
Thomas Alan Griffy, (1961) Ph.D., *Assistant Professor of Physics*
Egil Grislis, (1961) Ph.D., *Associate Professor of Religion*
Paul Magnus Gross, (1919) Ph.D., *William Howell Pegram Professor of Chemistry*
Samson Gross, (1960) Ph.D., *Associate Professor of Microbiology*
Walter R. Guild, (1960) Ph.D., *Associate Professor of Biochemistry*
*Norman Guttman, (1951) Ph.D., *Associate Professor of Psychology*
Frank Gregory Hall, (1926-42; 1945) Ph.D., *Professor of Physiology and Pharmacology*
Hugh Marshall Hall, (1953) Ph.D., *Associate Professor of Political Science*
**Louise Hall, (1931) S.B.Arch, Ph.D., *Professor of Architecture*
John Hamilton Hallowell, (1942) Ph.D., *Professor of Political Science*
William Baskerville Hamilton, (1936) Ph.D., *Professor of History*
Philip Handler, (1939) Ph.D., *James B. Duke Professor of Biochemistry and Nutrition*
Frank Allan Hanna, (1948) Ph.D., *Professor of Economics*
George Thomas Hargitt, (1930) Ph.D., Sc.D., *Professor Emeritus of Zoology*
Charles Morgan Harman, (1961) Ph.D., *Assistant Professor of Mechanical Engineering*
Ellwood Scott Harrar, (1936) Ph.D., *Professor of Wood Technology*
Paul Harrawood, (1956) M.S., *Assistant Professor of Civil Engineering*
A. Brooks Harris, (1963) Ph.D., *Instructor of Physics*
Reese T. Harris, (1959) Ph.D., *Assistant Professor of Mathematics*
Charles Cleveland Hatley, (1917) Ph.D., *Professor Emeritus of Physics*
Charles Roy Hauser, (1929) Ph.D., *James B. Duke Professor of Chemistry*
Fritz Heider, (1962) Ph.D., *Visiting William Preston Few Professor of Psychology*
Simeon K. Heninger, (1955) Ph.D., *Associate Professor of English*
Stuart C. Henry, (1959) Ph.D., *Professor of American Christianity*
*Frederick Herzog, (1960) B.D., Th.M., Th.D., *Associate Professor of Systematic Theology*
Duncan Charteris Hetherington, (1930) Ph.D., M.D., *Professor of Anatomy*
David William Hill, (1962) Ph.D., *Assistant Professor of Civil Engineering*
Douglas Greenwood Hill, (1931) Ph.D., *Professor of Chemistry*
R. L. Hill, (1962) Ph.D., *Associate Professor of Biochemistry*
*Hans J. Hillerbrand, (1959) Ph.D., *Associate Professor of Modern European Christianity*
Lowell A. Hinrichs, (1962) Ph.D., *Assistant Professor of Mathematics*
Marcus Edwin Hobbs, (1935) Ph.D., *Professor of Chemistry*

* Absent on Sabbatical Leave, Fall Semester, 1964.
** Absent on Sabbatical Leave, Spring Semester, 1965.

Paul E. Hochstein, (1963) Ph.D., *Assistant Professor of Physiology*
Irving B. Holley, Jr., (1947) Ph.D., *Professor of History*
Frederic B. M. Hollyday, (1959) Ph.D., *Assistant Professor of History*
Calvin Bryce Hoover, (1925) Ph.D., Litt.D., *James B. Duke Professor of Economics*
Edward Charles Horn, (1946) Ph.D., *Professor of Zoology*
Paul Horowicz, (1961) Ph.D., *Associate Professor of Physiology*
Jay Broadus Hubbell, (1927) Ph.D., Litt.D., *Professor Emeritus of English*
Alexander Hull, (1962) Ph.D., *Assistant Professor of Romance Languages*
††Wayland Elroy Hull, (1953) Ph.D., *Associate Professor of Physiology*
Harold J. Humm, (1954) Ph.D., *Associate Professor of Botany*
Mrs. Wanda Sanborn Hunter, (1947) Ph.D., *Associate Professor of Zoology*
Allan S. Hurlburt, (1956) Ph.D., *Professor of Education*
Mary Huse, (1962) Ph.D., *Lecturer in Psychology*
William H. Irving, (1936) B.A. (Oxon.), Ph.D., *Professor Emeritus of English*
William T. H. Jackson, (1964) Ph.D., *Visiting Professor of German and History*
Peter W. Jeffs, (1964) Ph.D., *Assistant Professor of Chemistry*
Howard Eikenberry Jensen, (1931) B.D., Ph.D., *Professor Emeritus of Sociology*
Bronislas de Leval Jezierski, (1958) Ph.D., *Associate Professor of Russian Language and Literature*
Edward A. Johnson, (1963) B.S., *Associate Professor of Physiology*
Terry W. Johnson, Jr., (1954) Ph.D., *Associate Professor of Botany*
Edward Ellsworth Jones, (1953) Ph.D., *Professor of Psychology*
Leon Lloyd Jones, (1963) Ph.D., *Assistant Professor of Chemistry*
Lyle E. Jones, (1961) Ph.D., *Visiting Professor in Psychology*
Brady Rimbey Jordan, (1927) Ph.D., *Professor Emeritus of Romance Languages*
Henry Kamin, (1948) Ph.D., *Associate Professor of Biochemistry*
John A. Kelingos, (1963) Ph.D., *Assistant Professor of Mathematics*
Van Leslie Kenyon, Jr., (1945) M.M.E., *Professor of Mechanical Engineering*
Alan C. Kerckhoff, (1958) Ph.D., *Professor of Sociology*
Gregory Adams Kimble, (1952) Ph.D., *Professor of Psychology*
Norman Kirshner, (1956) Ph.D., *Assistant Professor of Biochemistry and Nutrition*
**Peter H. Klopfer, (1958) Ph.D., *Associate Professor of Zoology*
K. R. Knoerr, (1961) Ph.D., *Assistant Professor of Forestry*
†† Sigmund Koch, (1942-47; 1948) Ph.D., *Professor of Psychology*
††Wellington Wesley Koepsel, (1963) Ph.D., *Associate Professor of Electrical Engineering*
Clarence Ferdinand Korstian, (1930) Ph.D., *Professor Emeritus of Silviculture*
Jack L. Kostyo (1959) Ph.D., *Assistant Professor of Physiology*
Paul Jackson Kramer, (1931) Ph.D., *James B. Duke Professor of Botany*
Irwin Kremen, (1963) Ph.D., *Assistant Professor of Psychology*
Juanita M. Kreps, (1955) Ph.D., *Associate Professor of Economics*
William R. Krigbaum, (1952) Ph.D., *Professor of Chemistry*
†Charles Albert Krummel, (1922) Ph.D., *Professor Emeritus of German*
Wladyslaw W. Kulski, (1963) Dr. jur., *James B. Duke Professor of Russian Affairs*
Sudhir Kumar, (1958) Ph.D., *Visiting Associate Professor of Civil Engineering*
Gary J. Kurowaski, (1962) Ph.D., *Visiting Associate Professor of Mathematics*
Weston La Barre, (1946) Ph.D., *Professor of Anthropology*

** Absent on Sabbatical Leave, Spring Semester, 1965.
† Died July 2, 1964.
†† Resigned, August 31, 1964.

Creighton Lacy, (1953) B.D., Ph.D., *Professor of Missions and Social Ethics*
Martin Lakin, (1958) Ph.D., *Associate Professor of Psychology*
Charles Earl Landon, (1926) Ph.D., *Professor of Economics*
John Tate Lanning, (1927) Ph.D., *James B. Duke Professor of History*
William Thomas Laprade, (1909) Ph.D., *Professor Emeritus of History*
John E. Larsh, Jr., (1943) Sc.D., *Professor of Parasitology*
Richard H. Leach, (1955) Ph.D., *Associate Professor of Political Science*
Warren Lerner, (1961) Ph.D., *Assistant Professor of History*
John B. Lewis, (1961) Ph.D., *Associate Professor of Electrical Engineering*
Harold Walter Lewis, (1949) Ph.D., *Professor of Physics*
John L. Lievsay, (1962) Ph.D., *Professor of English*
Daniel A. Livingstone, (1956) Ph.D., *Associate Professor of Zoology*
E. Croft Long, (1956) M.D., *Associate Professor of Physiology and Pharmacology*
Walter E. Loomis, (1962) Ph.D., *Visiting Professor of Botany*
Richard Lowitt, (1963) Ph.D., *Visiting Associate Professor of History*
Robert M. Lumiansky, (1963) Ph.D., *Professor of English*
William S. Lynn, Jr., (1954) M.D., *Assistant Professor of Biochemistry*
K. S. McCarty, (1950) Ph.D., *Associate Professor of Biochemistry*
William McCormack, (1964) Ph.D., *Associate Professor of Sociology*
John S. McGee, (1962) Ph.D., *Professor of Economics*
John C. McKinney, (1957) Ph.D., *Professor of Sociology*
Thomas J. McManus, (1961) M.D., *Assistant Professor of Physiology*
***John Nelson Macduff, (1956) M.E.E., *Professor of Mechanical Engineering*
George L. Maddox, (1960) Ph.D., *Professor of Sociology*
Alan Krebs Manchester, (1929) Ph.D., *Professor of History*
Joseph Eldredge Markee, (1943) Ph.D., *James B. Duke Professor of Anatomy*
Sidney David Markman, (1947) Ph.D., *Associate Professor of Art History and Archaeology*
Otto Meier, Jr., (1934) Ph.D., *Professor of Electrical Engineering*
Robert J. Menzies, (1962) Ph.D., *Professor of Zoology*
†††James Lathrop Meriam (1963) Ph.D., *Professor of Engineering Mechanics*
Richard S. Metzger, (1962) Ph.D., *Assistant Professor of Immunology*
Johannes Horst Max Meyer, (1959) D.Sc., *Professor of Physics*
John W. Moore, (1961) Ph.D., *Associate Professor of Physiology*
Montrose J. Moses, (1959) Ph.D., *Associate Professor of Anatomy*
***Francis Joseph Murray, (1960) Ph.D., *Professor of Mathematics*
Aubrey Willard Naylor, (1952) Ph.D., *Professor of Botany*
Glenn Robert Negley, (1946) Ph.D., *Professor of Philosophy*
Ernest William Nelson, (1926) Ph.D., *Professor of History*
Henry Winston Newson, (1948) Ph.D., *Professor of Physics*
Walter McKinley Nielsen, (1925) Ph.D., *James B. Duke Professor of Physics*
Holger O. V. Nygard, (1960) Ph.D., *Professor of English*
Walter D. Obrist, (1956) Ph.D., *Assistant Professor of Psychology*
David S. Onley, (1962) Ph.D., *Assistant Professor of Physics*
Henry John Oosting, (1932) Ph.D., *Professor of Botany*
J. G. Osborne, (1961) B.S., *Professor of Forestry*
Suydam Osterhout, (1959) Ph.D., *Assistant Professor of Microbiology*

*** Absent on Sabbatical Leave, 1964-65.
††† Leave of absence, February 1, 1965-August 31, 1965.

Athos Ottolenghi, (1959) M.D., *Assistant Professor of Physiology and Pharmacology*
††John R. Overman, (1955) M.D., *Associate Professor of Bacteriology*
Harry Ashton Owen, Jr., (1951) Ph.D., *Professor of Electrical Engineering*
Harold Talbot Parker, (1939) Ph.D., *Professor of History*
Joel Francis Paschal, (1954) Ph.D., *Professor of Law*
Ransom Rathbone Patrick, (1954) M.F.A., Ph.D., *Professor of Aesthetics and Art*
Robert Lee Patterson, (1945) B.D., Ph.D., *Professor Emeritus of Philosophy*
William Bernard Peach, (1951) Ph.D., *Professor of Philosophy*
George Wilbur Pearsall, (1964) Sc.D., *Associate Professor of Mechanical Engineering*
Talmage Lee Peele, (1939) M.D., *Professor of Anatomy*
**Harold Sanford Perry, (1932) Ph.D., *Professor of Botany*
Anton Peterlin, (1962) Ph.D., *Adjunct Professor of Chemistry*
Ray C. Petry, (1937) Ph.D., LL.D., *James B. Duke Professor of Church History*
Olan Lee Petty, (1952) Ph.D., *Associate Professor of Education*
Leland R. Phelps, (1961) Ph.D., *Associate Professor of German*
Jane Philpott, (1951) Ph.D., *Associate Professor of Botany*
Orrin Pilkey, (1965) Ph.D., *Assistant Professor of Geology*
Theo Clyde Pilkington, (1958) Ph.D., *Assistant Professor of Electrical Engineering*
Jacques C. Poirier, (1955) Ph.D., *Associate Professor of Chemistry*
W. H. Poteat, (1960) B.D., Ph.D., *Associate Professor of Christianity and Culture*
Benjamin Edward Powell, (1946) Ph.D., *Librarian*
¶¶¶Richard Lionel Predmore, (1950) D.M.L., *Professor of Romance Languages*
Jack J. Preiss, (1959) Ph.D., *Associate Professor of Sociology*
Richard A. Preston, (1961) Ph.D., *Visiting Professor of History*
James Ligon Price, Jr., (1952) Ph.D., *Professor of Religion*
Charles H. Proctor, (1961) Ph.D., *Visiting Associate Professor of Sociology*
Jesse Harris Proctor, (1958) Ph.D., *Assistant Professor of Political Science*
Louis DuBose Quin, (1956) Ph.D., *Associate Professor of Chemistry*
Charles William Ralston, (1953) Ph.D., *Professor of Forest Soils*
Robert Stanley Rankin, (1927) Ph.D., *Professor of Political Science*
R. John Rath, (1963) Ph.D., *Visiting Professor of History*
Eugene M. Renkin, (1963) Ph.D., *Professor of Pharmacology*
Thomas D. Reynolds, (1953) Ph.D., *Associate Professor of Mathematics*
Russell Roberson, (1963) Ph.D., *Assistant Professor of Physics*
††Henry Stoutte Roberts, Jr., (1948) Ph.D., *Associate Professor of Zoology*
John Henderson Roberts, (1931) Ph.D., *Professor of Mathematics*
Hermann R. Robl, (1959) Dr. habil., *Visiting Associate Professor of Physics*
Robert Samuel Rogers, (1937) Ph.D., F.A.A.R., *Professor of Latin*
Theodore Ropp, (1938) Ph.D., *Professor of History*
William L. Rowe (1963) Ph.D., *Associate Professor of Anthropology*
Donald Francis Roy, (1959) Ph.D., *Associate Professor of Sociology*
Mabel F. Rudisill, (1948) Ph.D., *Associate Professor of Education*
Ralph Wayne Rundles, (1945) Ph.D., M.D., *Professor of Medicine and Microbiology*
Herman Salinger, (1955) Ph.D., *Professor of German*
John V. Salzano, (1956) Ph.D., *Assistant Professor of Physiology*
Charles Richard Sanders, (1937) Ph.D., *Professor of English*

** Absent on Sabbatical Leave, Spring Semester, 1965.
†† Resigned, August 31, 1964.
¶¶¶ Absent on Sabbatical Leave, July 1, 1964 through January 3, 1965.

¶¶Lloyd Saville, (1946) Ph.D., *Professor of Economics*
Dwight P. Saylor, (1961) Ph.D., *Visiting Assistant Professor of Physics*
John Henry Saylor, (1928) Ph.D., *Professor of Chemistry*
††Mrs. Bodil Schmidt-Nielsen, (1956) D.D.S., Dr. Odont., Dr. Phil., *Associate Research Professor of Zoology*
Knut Schmidt-Nielsen, (1952), Mag.Sc., Dr. Phil., *James B. Duke Professor of Physiology*
Sally Hughes Schrader, (1962) Ph.D., *Visiting Professor of Zoology*
¶¶William E. Scott, (1958) Ph.D., *Associate Professor of History*
Richard A. Scoville, (1961) M.A., *Assistant Professor of Mathematics*
Richard Seymour, (1958) Ph.D., *Associate Professor of German*
Charles W. Shoppee, (1962) Ph.D., *Visiting Professor of Chemistry*
R. Baird Shuman, (1962) Ph.D., *Associate Professor of Education*
Barry Shmavonian, (1958) Ph.D., *Lecturer in Psychology*
***Joseph R. Shoenfield, (1952) Ph.D., *Assistant Professor of Mathematics*
†Ida H. Simpson, (1958) Ph.D., *Assistant Professor of Sociology*
Allan P. Sindler, (1959) Ph.D., *Associate Professor of Political Science*
David A. Smith, (1962) Ph.D., *Assistant Professor of Mathematics*
David Tillerson Smith, (1930) M.D., Litt.D., *James B. Duke Professor of Bacteriology*
Donald S. Smith, II, (1961) M.H.A., *Assistant Professor of Hospital Administration*
¶¶Grover C. Smith, (1952) Ph.D., *Associate Professor of English*
H. Shelton Smith, (1931) Ph.D., D.D., Litt.D., *James B. Duke Professor of American Religious Thought*
James M. Smith, (1962) Ph.D., *Visiting Professor of History*
***Joel Smith, (1958) Ph.D., *Associate Professor of Sociology*
Peter Smith, (1959) Ph.D., *Assistant Professor of Chemistry*
Robert Sidney Smith, (1932) Ph.D., *Professor of Economics*
George G. Somjen, (1963) M.D., *Assistant Professor of Physiology*
Marshall Spector, (1963) Ph.D., *Assistant Professor of Philosophy*
Hersey Everett Spence, (1918) B.D., D.D., Litt.D., *Professor Emeritus of Religious Education*
Joseph John Spengler, (1934) Ph.D., *James B. Duke Professor of Economics*
Robert Spira, (1962) Ph.D., *Visiting Assistant Professor of Mathematics*
Hertha D. E. Sponer, (1935) Ph.D., *Professor of Physics*
Olaf Stackelberg, (1963) Ph.D., *Assistant Professor of Mathematics*
W. J. Stambaugh, (1961) Ph.D., *Assistant Professor of Forestry*
Vivian T. Stannett, (1961) Ph.D., *Adjunct Professor of Chemistry*
Donald J. Stedman, (1963) Ph.D., *Assistant Professor of Medical Psychology*
Eric Stenius, (1961) D. Phil., *Visiting Professor of Philosophy*
Lionel Stevenson, (1955) B.Litt. (Oxon.) Ph.D., F.R.S.L., *James B. Duke Professor of English*
William Franklin Stinespring, (1936) Ph.D., *Professor of Old Testament and Semitics*
Donald E. Stone, (1963) Ph.D., *Assistant Professor of Botany*
Hiram M. Stout, (1962) Ph.D., *Visiting Professor of Political Science*
Howard Austin Strobel, (1948) Ph.D., *Professor of Chemistry*
John Strugnell, (1960) M.A., *Visiting Assistant Professor of Religion*

*** Absent on Leave, 1964-65.
† Resigned, May 31, 1964.
†† Resigned, August 31, 1964.
¶¶ Absent on Sabbatical Leave, 1965-66.

*Whippert A. Stumpf, (1948) Ph.D., *Professor of Education*
Henry L. Sublett, Jr., (1962) Ed.D., *Associate Professor of Education*
John Dennis Sullivan, (1959) Ph.D., *Assistant Professor of Wood Technology*
Elizabeth Read Sunderland, (1939-42; 1943) Ph.D., *Associate Professor of Art*
Lewis E. Swanson, (1949) A.B., *Associate Professor of Hospital Administration*
Charles Tanford, (1959) Ph.D., *Professor of Biochemistry*
Frank Tangherlini, (1961) Ph.D., *Visiting Assistant Professor of Physics*
Marcel Tetel, (1960) Ph.D., *Assistant Professor of Romance Languages*
Ralph E. Thiers, (1960) Ph.D., *Associate Professor of Biochemistry*
**Joseph Miller Thomas, (1930) Ph.D., *Professor of Mathematics*
**Edgar Tristram Thompson, (1935) Ph.D., *Professor of Sociology*
E. Clifford Toren, Jr., (1961) Ph.D., *Assistant Professor of Chemistry*
D. C. Tosteson, (1961) M.D., *Professor of Physiology*
James Nardin Truesdale, (1930) Ph.D., *Professor of Greek*
Vance Tucker, (1964) Ph.D., *Assistant Professor of Zoology*
Arlin Turner, (1953) Ph.D., *Professor of English*
Charles Rowe Vail, (1939) Ph.D., *Professor of Electrical Engineering*
†F. John Vernberg, (1951) Ph.D., *Associate Professor of Zoology*
Aleksandar Sedmak Vesic, (1964) D.Sc., *Professor of Civil Engineering*
Patrick R. Vincent, (1954) Ph.D., *Associate Professor of Romance Languages*
Clement Vollmer, (1926) Ph.D., *Professor Emeritus of German*
Herbert von Beckerath, (1935) Ph.D., *Professor Emeritus of Economics and Political Science*
Warren Chase Vosburgh, (1928) Ph.D., *Professor Emeritus of Chemistry*
Stephen A. Wainwright, (1964), Ph.D., *Associate Professor of Zoology*
Salih J. Wakil, (1959) Ph.D., *Associate Professor of Biochemistry and Nutrition*
Herman Walker, (1962) Ph.D., *Visiting Professor of Political Science*
W. H. Wallace, (1962) Ph.D., *Assistant Professor of Accounting*
Michael Wallach, (1962) Ph.D., *Associate Professor of Psychology*
Richard L. Walter, (1962) Ph.D., *Assistant Professor of Physics*
Loring Baker Walton, (1929) Lic. és L. Ph.D., *Professor Emeritus of Romance Languages*
Calvin L. Ward, (1952) Ph.D., *Associate Professor of Zoology*
*Charles Eugene Ward, (1927) Ph.D., *Professor of English*
Bruce W. Wardropper, (1962) Ph.D., *Professor of Romance Languages*
***Seth L. Warner, (1955) Ph.D., *Associate Professor of Mathematics*
Richard Lyness Watson, Jr., (1939) Ph.D., *Professor of History*
Henry Weitz, (1950) Ed.D., *Associate Professor of Education*
Bruce Arrington Wells, (1964) M.S.E.E., *Visiting Lecturer in Electrical Engineering*
Richard L. Wells, (1962) Ph.D., *Assistant Professor of Chemistry*
Paul Welsh, (1948) Ph.D., *Professor of Philosophy*
Robert W. Wheat, (1956) Ph.D., *Assistant Professor of Biochemistry*
Richard A. White, (1963) Ph.D., *Assistant Professor of Botany*
Alban Gregory Widgery, (1930) M.A., *Professor Emeritus of Philosophy*
Karl Milton Wilbur, (1946) Ph.D., *James B. Duke Professor of Zoology*
¶Robert L. Wilbur, (1957) Ph.D., *Associate Professor of Botany*

* Absent on Sabbatical Leave, Fall Semester, 1964.
** Absent on Sabbatical Leave, Spring Semester, 1965.
*** Absent on Sabbatical Leave, 1964-65.
† Absent on Sabbatical Leave, January 15, 1965 through January 14, 1966.
¶ Absent on Sabbatical Leave, February 1, 1965-January 31, 1966.

Pelham Wilder, Jr., (1949) Ph.D., *Professor of Chemistry*
Mrs. Hilda Pope Willett, (1948) Ph.D., *Associate Professor of Bacteriology*
George W. Williams, (1957) Ph.D., *Associate Professor of English*
James W. Williams, (1937) M.S., *Professor of Civil Engineering*
Robert Marshall Williamson, (1951) Ph.D., *Associate Professor of Physics*
A. Leslie Wilson, (1961) Ph.D., *Associate Professor of German*
Neil L. Wilson, (1957) Ph.D., *Assistant Professor of Philosophy*
Robert Renbert Wilson, (1925) Ph.D., LL.D., *James B. Duke Professor of Political Science*
Thomas George Wilson, (1959) Sc.D., *Professor of Electrical Engineering*
Manfred Winnewisser, (1963) Ph.D., *Instructor in Physics*
H. H. Winsborough, (1962) Ph.D., *Assistant Professor of Sociology*
Orval S. Wintermute, (1958) B.D., *Assistant Professor in Religion*
Frederick Adolphus Wolf, (1927) Ph.D., *James B. Duke Professor Emeritus of Botany*
Donald J. Wood, (1962) Ph.D., *Assistant Professor of Civil Engineering*
Frank Wilson Woods, (1958) Ph.D., *Associate Professor of Silviculture*
Robert Hilliard Woody, (1929) Ph.D., *Professor of History*
J. B. Wyngaarden, (1959) M.D., *Associate Professor of Biochemistry*
***William P. Yohe, (1958) Ph.D., *Associate Professor of Economics*
*James G. Yoho, (1957) Ph.D., *Professor of Forest Economics*
Charles R. Young, (1954) Ph.D., *Associate Professor of History*
††Karl Edward Zener, (1928) Ph.D., *Professor of Psychology*
Chester M. Zmijewski, (1963) Ph.D., *Assistant Professor of Immunology*

* Leave of Absence, Fall Semester, 1964.
*** Absent on Sabbatical Leave, 1964-65.
†† Died, September 27, 1964.

General Regulations Governing Graduate Study

Admission

PREREQUISITES. A student seeking admission to the Graduate School of Arts and Sciences of Duke University must have received an A.B. or B.S. degree (or the equivalent in the case of foreign students) from an accredited institution. His undergraduate program should be well rounded and of such quality as to give positive evidence of capacity for graduate study. Normally he should have majored in the area of his intended graduate study. Many departments (see Courses of Instruction, pp. 63 ff.) list specific prerequisites. Students are urged to anticipate at least one of the language requirements (see pp. 27-29).

STUDENTS REQUIRING ADMISSION. Admission is required of 1) all students who intend to pursue study toward a degree offered by the Graduate School, 2) all other students who desire credit for whatever purpose for graduate courses—except students who register as Special Students in the Summer Session. Students who have discontinued a program of study after earning a master's degree here must by letter request permission of the Dean to undertake a doctoral program.

PROCEDURE FOR ALL APPLICANTS. A student seeking admission to the Graduate School should request the Dean of the Graduate School to send an application blank. This he should fill out completely and return promptly. In addition he should provide the following supporting documents: (1) a transcript or transcripts of all his undergraduate and graduate work mailed directly by the registrar to the Dean; (2) as soon as possible, supplementary transcripts showing completion of work in progress when the earlier transcript was made; (3) three letters of recommendation written by persons best qualified to judge him as a prospective graduate student and mailed directly to the Dean; (4) scores on the Graduate Record Examination or Miller Analogies Test as indicated.

All applicants except foreign students applying from outside the United States must include an application fee of $5.00 in check or money order payable to Duke University.

GRADUATE RECORD EXAMINATION AND MILLER ANAL-

OGIES TEST. As additional evidence of capability scores on the Graduate Record Examination, particularly the Aptitude Test, and on the Miller Analogies Test are strongly recommended in all departments and must be submitted if either test has been taken. Scores on the Graduate Record Examination may be requested of any applicant whose record is marginal and must be submitted by all applicants for a fellowship. Departments that require scores of all applicants are listed below:

	Graduate Record Examination		
	Aptitude Test	Advanced Test	Miller Analogies Test
Anatomy	×	×	
Botany	×	×	
Economics	×	×	
English	×	×	
Forestry	×		
Germanic Languages	×		
History	×		
Philosophy	×		×[1]
Physiology	×		
Psychology	×		×
Romance Languages	×	×	
Zoology	×	×	×[1]

[1] Either GRE or MAT.

(Information on times and places of Graduate Record Examinations can be provided at the applicant's college or by the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.)

ADDITIONAL PROCEDURE FOR FOREIGN STUDENTS. Fully qualified students from outside the United States are welcomed in the Graduate School to take courses and in many instances to study toward a degree. In applying for admission the foreign student should, in addition to the information required of all students, submit with his application (1) if his native language is not English, certification of ability to use English such as scores on tests provided by the Educational Testing Service, the University of Michigan Language Institute, or the American University Language Center, (2) a statement certified by a responsible person that his finances are sufficient to maintain him during his stay at Duke University, and (3) a statement by a qualified medical doctor describing any emotional or physical illness the applicant has had during the previous five years.

All foreign students whose native language is not English will be examined during their first registration period for competence in the use of oral and written English. Until competence is determined,

admission and arrangements for an award involving teaching must remain provisional. Students found to lack the necessary competence will be required to enroll in the non-credit course English for Foreign Students and to reduce their course or research program three units if necessary. Passing this examination or the course, if it is required, will not meet degree requirements for a foreign language. (See page 29.)

CLOSING DATES FOR APPLICATIONS. Because applications cannot be reviewed until all required supporting documents are filed, applications should be submitted at least *two weeks* before the closing dates listed below:

Fall semester, admission and award	February 15
Fall semester, admission only	August 1
Spring semester, admission only	January 1
Summer Session,* First Term	May 14
Summer Session,* Second Term	June 20

It is the applicant's responsibility to make certain that his application is completed and in order before the dates specified.

NOTIFICATION AND STATUS. When admission is approved, the student will receive a letter of admission and an acceptance form. The process of admission is not complete until the statement of acceptance has been returned.

Applicants who are admitted will be offered full admission, provisional admission, or non-degree admission. *Provisional admission* is offered to students who (1) appear to warrant admission but who do not fully comply with admission requirements, for a trial period of one semester or a minimum of 12 hours of course work, or (2) are admissible except that the application lacks a letter of recommendation, a supplementary transcript, required test scores, or some other required information. *Non-degree admission* is offered to students who (1) have no intention of taking an advanced degree at Duke University but wish to take courses for accreditation, for transfer to other institutions, or for other purposes, (2) do not fully meet admission requirements but wish to further their academic interests, and (3) who apply late and must register before the application can be fully considered. Graduate credit earned under *provisional status* may be applied toward an advanced degree at Duke University if and when upon review the student is granted full admission; graduate credit earned under *non-degree* status may not be applied toward an advanced degree at Duke University. Late applicants ((3) above)

* Students seeking admission to the Graduate School for study in the Summer Session should make application to the Dean of the Graduate School as well as to the Director of the Summer Session.

will be granted full admission if admission can be completed within two weeks of registration.

Registration

WHO MUST REGISTER. (1) All students who enter course work or residence for credit; (2) all students who have completed minimum requirements for an advanced degree, but continue to use the facilities of the University in their research; (3) all students in *in absentia* status; (4) all students who wish merely to audit a course or courses.

REGISTRATION. After the applicant has received notification of his admission to the Graduate School and has returned his statement of acceptance of admission, he may present himself for registration. During the registration periods, announced in the *Bulletin*, he first confers with the Director of Graduate Studies of his major department, who prepares and signs a course card, listing the course work to be taken during the semester. The student then presents this course card to registration officials, who enroll him officially in his courses. After his first registration period as a current student he will pre-register at the stated times for pre-registration. Failure to pre-register incurs the penalty for late registration. *Former students* who intend to register to resume a degree program must give the Department and the Dean notice of this intention two months before registration.

LATE REGISTRATION. All students are expected to register or pre-register at the times stated in the *Bulletin*. Those registering late, including those who are obliged to register *in absentia*, are subject to a *late registration fee of five dollars.*

CHANGE OF REGISTRATION. During the academic year within a period of *fourteen days* from the registration date students may change registration with the approval of the Director of Graduate Studies, if no reduction of fee is involved, and with the approval of the Dean if reduction of fee is involved. Thereafter during the first thirty days from the registration date the only permissible change is dropping course-seminar registration and adding equivalent units of research, with the approval of the Director of Graduate Studies, the instructor of the course, and the Dean.

Grades, Hours, and Credits

Although ideally graduate study is principally individual reading, research, and laboratory experimentation under guidance, academic progress in the United States is generally measured and recorded in

terms of course hours and credits. The term *residence* designates full-time study and research in close proximity to facilities provided for both as opposed to part-time study incidental to a full-time occupation. Here required *residence* of one year is defined as two successive academic semesters of not less than nine units registration each semester. Credit for courses and seminars, research, and residence, and corresponding tuition and fees are stated in terms of units. According to conventional measurement one unit is equivalent to one semester hour.

CREDITS EARNED OUTSIDE THIS GRADUATE SCHOOL

(1) *Graduate Credit Earned before the A.B. Degree Is Granted.* Ordinarily no credit will be allowed for graduate courses earned before a student has been awarded his A.B. or B.S. degree. However, an undergraduate student at Duke University who, at the beginning of his final semester, lacks no more than 9 semester hours of fulfilling the requirements for the A.B. or B.S. degree, may obtain permission from the Dean of the Graduate School to enroll for graduate courses sufficient to bring his total program to fifteen hours a week. Such graduate courses will be credited toward the A.M., M.S., M.Ed., or M.A.T. degree, provided that the student meets the requirements for admission to the Graduate School, and that he is duly registered in the Graduate School at the beginning of the final semester.

Duke undergraduates in the Honors-Masters program provisionally may be granted this type of admission at the beginning of their seventh semester provided that at the beginning of their final semester they will meet the requirement stated above.

(2) *Transfer of Graduate Credits.* Credit for graduate course work earned at another institution will be determined only after a student has spent one semester at Duke University. After completing his first semester, the student through his Director of Graduate Studies should file a request that his credits be reviewed and a decision made.

(3) *Graduate Credit for Courses Taken in the School of Law.* Upon the recommendation of the Director of Graduate Studies, and upon the approval of the Dean of the Graduate School, students in the social sciences may take certain courses in the School of Law for graduate credit. In some instances courses in the School of Law may be considered as fulfilling a student's requirements for a minor. To register for such courses, the student should present a letter from his Director of Graduate Studies to the Dean of the School of Law requesting permission to register for certain specified courses.

(4) *Reciprocal Agreement with the Consolidated University of North Carolina.* Under a plan of co-operation between the Consolidated University of North Carolina and Duke University, students

regularly enrolled in the Graduate Schools of the Consolidated University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester in the Graduate School of Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students in the Graduate School of Duke University may be admitted to course work at the Consolidated University of North Carolina. A similar arrangement is effective in the Summer Session. (See the Summer Session Bulletin.)

GRADES. Grades in the Graduate School are as follows: *E, G, S, F,* and *I*. *E* (exceptional) is the highest mark. *G* (good) and *S* (satisfactory) are the remaining passing marks. *F* (failing) is below passing, and *I* (incomplete) indicates that some portion of the student's work is lacking, *for an acceptable reason,* at the time the grades are reported. The instructor who gives an *I* for a course specifies the date by which the student must have made up the deficiency, in no case more than one calendar year from the date the course ended. If the course is not completed, the grade of *F* is entered upon the student's record unless his appeal to the Dean for the grade *No Credit* is approved. The grade of *Z* indicates satisfactory progress at the end of the first semester of a two-semester course. It will be changed to whatever grade is appropriate upon the completion of the course. A grade of *F* in a major course normally occasions withdrawal from a degree program not later than the end of the ensuing semester or term; a grade of *F* in a minor course occasions academic probation.

COURSES PRIMARILY FOR UNDERGRADUATES. Students granted provisional admission and others whose preparation is found deficient may on occasion be required as part of their program to take undergraduate courses as prerequisites to continued graduate study. Undergraduate courses thus taken and others elected by the student will carry no graduate credit.

In exceptional cases, 100-level courses *outside the major department* may be taken for graduate credit to a maximum of two one-semester courses or one year-course not exceeding a total of 8 units, when approved by the Directors of Graduate Studies in the major department and in the department in which the course is listed and by the supervisor of the program.

NORMAL REGISTRATION. A graduate student is designated as fully registered when he registers for the maximum credit his program requires. Required registration is set in consideration of the student's obligation to teach or assist and the stage he has reached in completion of degree requirements. Normal registration for the resident student who does not hold an appointment as part-time

instructor or assistant is 15 units a semester or 30 units an academic year. The normal registration for the student who holds such an appointment is either 12 units or a minimum of 9 depending upon the number of hours a week he is required to teach or assist.

The resident student in a terminal master's program which requires no thesis carries normal registration until he has met all degree requirements. If a thesis is required and the student has met all requirements except for submitting his thesis, he registers for 3 units a semester while in residence or, if he elects to go out of residence, for 1 unit *in absentia* (a semester) until the thesis is accepted.

The resident student engaged in a master's program which is not terminal but preparatory to a doctoral program registers as though he were a doctoral student.

The resident student in a doctoral program carries normal registration through the semester in which he passes the preliminary examination. Thereafter until the dissertation is accepted he registers for a minimum of 3 units a semester. If he elects at any time to go out of residence, to keep his program active he registers for 1 unit a semester *in absentia*.

The registration of 1 unit a semester *in absentia* is not considered full registration and does not provide access to library carrel, laboratory space, or Student Health but does permit occasional consultation with the thesis or dissertation supervisor. It may be waived for military duty or serious problems of health. Master's candidates subject to the fee for submitting a thesis in the academic year may credit the 1-unit fee to this charge.

In the Summer Session 6 units a term is maximum registration. Students resident in the academic year who wish to continue study and use of University facilities including Summer Session Student Health during the summer must register for 1 unit in the first Summer Session term. This registration provides use of these facilities for both terms.

WITHDRAWAL AND INTERRUPTION OF PROGRAM

From a Course. For permissible changes during the first thirty days after the registration date, see Change of Registration, page 23. If a course is dropped without the necessary approval, the permanent record will list the course as *Dropped Unofficially, F.* If a course is dropped after the thirty-day period, the status of the student at the time of withdrawal from the course will be determined and be indicated on the permanent record as *Withdrew Passing (W.P.) or Withdrew Failing (W.F.).*

From the Graduate School. The University reserves the right, and matriculation by the student is a concession of this right, to request the withdrawal of any student whose conduct at any time is not satis-

factory to the University, even though no specific charge be made against the student. If a student wishes for any reason to withdraw from the Graduate School, he should notify both the Director of Graduate Studies in his major department and the Dean of the Graduate School prior to the date of his expected withdrawal. (For refunds upon withdrawal, see above, p. 23.) For withdrawal occasioned by academic failure see p. 25.

Students who find it necessary to interrupt their program of study for a period longer than a summer vacation should, before departure, leave with the Graduate Office a statement of the reason for interruption, mailing address, and expected date of return. If they are subject to registration *in absentia*, they should arrange for such registration before departure.

A foreign student who after successfully completing a minimum of one semester's graduate study must withdraw for the purpose of returning home before the completion of a graduate program may with the approval of his major department request the Dean to issue him a Certificate of Graduate Study.

TRANSCRIPT. A student who wishes to transfer his credits from Duke University to another institution is entitled to one free transcript of his record. A fee of one dollar, payable in advance, is charged for each additional copy. Requests are directed to the Central Records Office.

SIZE OF CLASSES. Classes which carry graduate credit are limited in size to thirty students. In exceptional cases this regulation may be modified, but only by permission of the Executive Committee of the Graduate School Faculty on the recommendation of the department concerned. When courses numbered 200 to 299 carry graduate credit, they may include no more than three juniors and such juniors must, at the time of registration, have an over-all B average.

Language Requirements

Because a requirement for the A.M. degree is mastery of one acceptable foreign language, and for the Ph.D. is mastery of two, the prospective graduate student should attain mastery of at least one acceptable foreign language and preferably two before applying for admission. The facilities for graduate study are highly specialized and costly. The student who must lay them aside to acquire what he could have learned as an undergraduate is wasting his time.

To prevent delay in meeting this requirement, students whose programs call for mastery of French, Spanish, or German and who have studied the language must take the objective screening examination at their first registration period.

ACCEPTABLE LANGUAGES. The languages normally required are French, German, and Russian, but with the approval of the Dean of the Graduate School, a student may substitute for any one of these another language which has a definite relation to the candidate's program of work for the degree and for which an examination can be provided.

MEETING THE REQUIREMENTS. Language requirements may be met before, during, or after first registration here in the following ways:

BEFORE FIRST REGISTRATION

1. BY TRANSCRIPT. With the permission of the Dean of the Graduate School and of the chairman of his program committee or of the Director of Graduate Studies, the doctoral student may file a transcript or other certification as evidence of having passed a comparable examination at another graduate institution. The limitations are that 1) only one of the two doctoral requirements may be met in this way, 2) the other institution offers a doctoral program in the student's major and that the examination would have met a doctoral requirement there, and 3) the examination was passed no more than five years before first registration here.
2. BY ETS SCORES. The Educational Testing Service Graduate School Foreign Language tests in French, German, and Russian are offered at many centers including Duke University Counseling Center upon nationally uniform dates. Scores on these tests taken elsewhere not more than five years before first registration here may be offered to meet the master's degree requirement of one language or the doctoral requirement of two.

AT FIRST REGISTRATION

On Monday of the fall registration period and on the day before spring registration, objective reading, grammar, and vocabulary tests in French, German, and Spanish are offered (see the Calendar for hour and place). Any entering student in the master's or doctoral program may take them. On the basis of his scores the student will be 1) certified as meeting requirements in these languages, 2) advised after review to present himself for the ETS tests (French, German) or the locally-prepared reading test in Spanish, or 3) advised to enroll in the special reading course (see below).

AFTER FIRST REGISTRATION

1. Students who first registered in September 1964 and thereafter and who wish to be examined in French, German, or Russian

will take the ETS tests. For Spanish they will take the locally-prepared reading test.

2. Students who began a program before September 1964 may take either the ETS test or the locally-prepared reading tests in French, German, Russian, Spanish, and, upon request, Italian.

Reading examinations in other languages must be individually arranged. Each ETS examination requires a fee of $8. The student who requires a re-examination in the locally-prepared reading examination at scheduled times will be charged $5 for each re-examination; if special times are necessary, the fee will be $10. Examinations at special times cannot be offered in French and Spanish.

SPECIAL READING COURSES. Special courses designed to assist graduate students in acquiring a reading knowledge of French or German are offered for three hours a week, French during the fall semester, German during the spring semester and the Summer Session. A student who registers for either course must reduce his normal load of graduate courses by three units, with no reduction in fees. *No auditors* are permitted in these courses at any time. Undergraduates may not enroll during the academic year and may, with permission of the Dean of the Graduate School, in the Summer Session only if total registration permits.

REQUIREMENTS FOR FOREIGN STUDENTS. Foreign students whose native language is not English are, during their first registration period, required to take a test for minimum competence in English (see p. 21). Such students, with the approval of the Director of Graduate Studies in their major department, may request permission of the Dean of the Graduate School to substitute English for *one* of the required foreign languages in the doctoral program. If permission is granted, an additional reading test in English will be arranged.

Degrees Offered

THE DEGREES OFFERED. The Graduate School of Arts and Sciences now offers the following degrees: Master of Arts (A.M.), Master of Science (M.S.), Master of Education (M.Ed.), Master of Arts in Teaching (M.A.T.), Master of Hospital Administration (M.H.A.), Doctor of Philosophy (Ph.D.), and the Doctor of Education (Ed.D.)

General Regulations Governing Master's Degrees

RESIDENCE REQUIREMENTS. Candidates for all Master's degrees must spend, as a *minimum*, one full academic year, or its equivalent in Summer Session terms, in residence at Duke University. (See p. 24.) Those who wish to complete their degrees wholly in the Summer Session must be in residence for five terms. Often more time will prove necessary in either case, depending upon the nature of the student's research problem if a thesis is offered and upon the student himself.

A Master's degree *without thesis* requires a *minimum* of 30 units of graduate credit in course and seminar work properly distributed between major and minor fields.

A Master's degree *with thesis* requires a *minimum* of 30 units of graduate credit; not less than 24 units must be in course or seminar work properly distributed between major and minor fields. If after completion of the 30-unit requirement the candidate remains in residence, he must register for a minimum of 3 units per semester.

A Master's candidate who presents a thesis when not registered in residence will be charged 3 units of residence for the semester in which the thesis is presented. (See above p. 26 and for fees for completing the degree during the Summer Session see the Summer Session Bulletin.)

CANDIDACY FOR THE MASTER'S DEGREE. To be considered as a candidate for a Master's degree (A.M., M.S., M.Ed., M.A.T., M.H.A.), the graduate student must (1) have made passing grades in all courses taken during the first period of residence (if he registers for fewer than 12 units of graduate courses during his first period of residence, he must make passing grades on the first 12 units of graduate courses), (2) have made a grade of *G* or *E* on at least 3

units of this work, and (3) have received the approval of the major department (or in the case of the M.A.T., of the supervisory committee).

TRANSFER OF GRADUATE CREDITS. (See above, p. 24.)

Under certain circumstances a maximum credit of 6 units may be allowed for graduate courses completed elsewhere. The acceptance of credit up to this amount, however, will not reduce the minimum of required registration at Duke University.

With the approval of both the student's major department and the Dean of the Graduate School, a student who is granted such transfer credit may be permitted to register for as much as 12 units of thesis research instead of the usual 6 units. Or he may be permitted to fill out his schedule with as much as 6 units of further undergraduate training or 6 units of required language courses on the undergraduate level. In no case will credit be allowed for extension or correspondence courses.

TIME LIMITS FOR COMPLETION OF MASTER'S DEGREES. The candidate for the Master's degree who is in residence for consecutive academic years should complete all requirements for the degree *within two calendar years* from the date of his first registration in the Graduate School. *Any candidate* must complete all requirements *within six calendar years* of his first registration.

THE THESIS. The thesis should demonstrate the student's ability to collect, arrange, interpret, and report pertinent material on his special research problem. Although a publishable document is not required, the thesis must be written in an acceptable style and should exhibit the student's competence in scholarly procedures. Requirements of form are set forth in the Duke University *Manual of Style for Theses and Dissertations,* revised 1961, obtainable at the Duke University Book Store.

The Master of Arts

PREREQUISITES. As prerequisites to graduate study in his major subject, the student must have completed a *minimum* of 12 semester hours of approved college courses in that subject, and 12 additional semester hours in that subject or in related work. Since some departments require more than 12 semester hours, the student should read carefully the special requirements listed by his major department, which are included as headnotes to the course offerings in this bulletin.

LANGUAGE REQUIREMENTS. The candidate for the A.M. degree must have a reading knowledge of at least one modern foreign language. (The several departments reserve the right to specify which foreign languages are acceptable.) For methods of satisfying language

requirements see p. 28. The language requirement must be satisfied before the Master's examination is taken.

MAJOR AND MINOR SUBJECT. In his graduate work the student must present acceptable grades for a minimum of 24 units of graduate courses. Of these, at least 12 units must be in the major subject. The student must take a minimum of 6 units in a minor subject or related fields which are approved by his major department. The remaining 6 units of the required 24 may be taken in either the major or minor department, or in another approved by the major department and by the Dean of the Graduate School. In addition he must present a thesis, which carries a credit of 6 units for which he must register. Thus, his earned credit for the degree totals a *minimum* of 30 units.

FILING THE THESIS TITLE. At least one month before presenting the thesis, that is on or *before March 1 for a June degree* or on or *before July 1 for a September degree,* the student must file with the Dean of the Graduate School, on the official form, the title of the thesis and declaration of intention to graduate. The title must have the approval of the Director of Graduate Studies in the major department, and of the thesis supervisor.

PREPARING THE THESIS. All basic requirements for preparing the thesis are described in the *Manual of Style for Theses and Dissertations,* revised 1961, obtained at the Duke University Book Store, West Campus. The quality of paper, form, and binding are prescribed in the *Manual.*

SUBMITTING THE THESIS. Four typewritten copies of the thesis bound in snap binders supplied by the Library must be submitted in approved form to the Dean of the Graduate School on or before May 1 for a June degree or August 15 for a September degree and three to five days before the scheduled date of the student's examination. The copies will then be distributed to the several members of the examining committee. Two copies for the Library will be bound by the Ruzicka Bindery, fee $5.00 a volume. The student will state whether or not he wishes more than two so bound.

THE EXAMINING COMMITTEE AND THE EXAMINATION. The instructor who directs the thesis appoints an examining committee composed of the supervisor of the thesis and two other members of the Graduate Faculty, one of whom must be from a department other than that of the major. If the student has been permitted to take related work within the major department, the third member may represent the minor field within the department. This committee is submitted for approval to the Dean of the Graduate School when the thesis is first presented.

The candidate appears before this committee for an examination

which lasts for about one and one-half hours. The subject matter covered in the examination is usually restricted to the thesis and to the major field.

If the candidate passes his examination, the examining committee certifies this fact by signing the title page of all copies of the thesis. The candidate then returns the original, the first carbon copy of the thesis, and any others he wishes bound by Ruzicka, to the Dean of the Graduate School, who deposits them in the University Library.

The Master of Science

PREREQUISITES. The degree of Master of Science is offered in the fields of Civil, Electrical, and Mechanical Engineering. As prerequisites to this degree the student must have earned a Bachelor's degree from an accredited engineering college and have completed a minimum of 12 semester hours work in the major field.

FOREIGN LANGUAGE. There is no foreign language requirement for this degree.

MAJOR AND MINOR SUBJECTS. The work for the Master of Science degree is designed to provide a broad foundation in the fields of civil, electrical, and mechanical engineering. The student must present acceptable grades for a minimum of 24 units of graduate courses: at least 12 in course work in his major area of concentration in engineering (not necessarily confined to the offerings of the engineering department in which the student is registered); a minimum of 6 units in a minor subject outside of engineering which lends broad support to his program (usually in the mathematical or natural sciences); and the remaining 6 of the 24-unit course requirement in either the major or minor subject, or in an area approved by the major department and by the Dean of Engineering. In addition to the 24-unit course requirement, the student must present a thesis, which carries a credit of 6 units. Thus his earned credit for the degree totals a minimum of 30 units.

REGULATIONS AND PROCEDURES. The regulations and procedures for the thesis and the provisions for examination and an examining committee are the same as those for the Master of Arts degree.

The Master of Education

PREREQUISITES. Before a student is admitted to graduate study for this degree, he should have completed, on the undergraduate level, a minimum of 18 semester hours of approved work in Education.

Before the degree is conferred the student must have had one year

of actual teaching experience, or have met certification requirements by supervised student teaching in an accredited school. Such supervised student teaching may be at either the undergraduate or the graduate level.

REQUIREMENTS FOR THE DEGREE. The Master of Education degree may be earned either with or without the presentation of a thesis.

Without thesis: The required work includes a departmental major (Administration, Counseling, Elementary Education, Secondary Education, or Teaching the Emotionally Disturbed) of at least 12 units, and a minor of at least 6 units outside the Department of Education. The remaining 12 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

Toward the end of his residence the student must pass a comprehensive examination on his departmental major. This examination shall be prepared and conducted by the instructors of the student's major as designated by the Director of Graduate Studies of the Department of Education. Request to take this examination should be made to the Director of Graduate Studies at least two weeks before the date on which the examination is to be conducted.

With thesis: Students who elect this plan are permitted to substitute a thesis for 6 units for the required course work. The thesis subject must be approved by the instructor who is to direct it, and by the Director of Graduate Studies.

In addition to the thesis, the student must present at least 24 units of course credit. Of these, 12 units must be taken in the student's departmental major. Six units, constituting a minor, must be taken outside of the Department of Education. The remaining 6 units are elective within the area of Education and the minor field, but require the approval of the student's major advisor and the Director of Graduate Studies.

The regulations governing the thesis are the same as those for the Master of Arts degree.

The Master of Arts in Teaching

PREREQUISITES. The degree of Master of Arts in Teaching is designed for teachers already in service and for recent graduates of liberal arts colleges who wish to enter public school teaching.

A student should normally have completed a minimum of 12 semester hours in his proposed major subject and an additional 12 semester hours in that or related subjects. Should a student wish to undertake a graduate major different from his undergraduate major,

the prerequisites may be modified upon the recommendation of the student's committee and the approval of the Dean of the Graduate School.

PROGRAMS FOR THE DEGREE. Either of two programs may be arranged, in consultation with the student's committee:

A. A major in Education of 18 to 24 units and 6 to 12 units in non-education courses (for students seeking certification).

B. A major in non-education courses of 18 to 24 units and 6 to 12 units in Education (for students already certified).

In both programs a *minimum* of 30 units is required.

The non-education courses are to be taken in one or more subjects ordinarily taught in the secondary schools. The amount and distribution of this work will be determined by the needs of the individual student. A major in Biological Sciences or in Physical Sciences is possible in this program.

The Master of Arts in Teaching may be earned with or without the presentation of a thesis. If a student, in consultation with his committee, elects to present a thesis, 6 units of the total of 30 units required will be allotted to thesis research. He will then be required to complete 24 units of course credits. The regulations governing the thesis are the same as those for the A.M. (see p. 31). Candidates for the Master of Arts in Teaching who have not had teaching experience are required to take Education 215-216 in which case a minimum of 36 units is required.

THE COMMITTEE. Each candidate for the degree will be assigned a committee, appointed by the Director of Graduate Studies in the major department or area. This committee will consist of three members, at least one of whom will be from the Department of Education, and at least one from another department. The chairman of the committee will normally be chosen from the department of the major.

RECOMMENDATION FOR TEACHER CERTIFICATION. Elementary school teachers who already hold certificates and who desire the recommendation of Duke University for a graduate teaching certificate must include in their Master's program a minimum of 12 semester hours in subjects ordinarily taught in elementary school and 12 semester hours in courses in education designed to improve them as elementary school teachers.

Secondary school teachers who already hold certificates and desire the recommendation of Duke University for graduate teaching certificates must include in their Master's program a minimum of 18 semester hours in their teaching fields and 6 semester hours in courses in education designed to improve them as secondary school teachers.

The Master of Hospital Administration

PREREQUISITES. The Master of Hospital Administration degree is designed for persons intending to pursue a career of management in hospitals and other health agencies.

No specific undergraduate major is required for participation in graduate studies leading to this degree, but certain courses are prerequisites. Required are:

2 semesters of natural sciences
2 semesters of economics or political science, or 1 semester of each
2 semesters of psychology or sociology, or 1 semester of each
2 semesters of accounting, either basic or managerial

In selected cases, students who have not completed all prerequisites may be admitted on a conditional basis subject to completion of deficiencies while completing other requirements of the degree program.

PROGRAM FOR THE DEGREE. The program for this degree includes 36 graduate units, of which 18 are in courses in Hospital Administration and 18 are in designated courses in Economics, Political Science, and Sociology.

Completion of this program ordinarily requires 24 months. Included is a 12-month administrative residency which is conducted under faculty supervision in hospitals and other health agencies within commuting distance of the University campus. A portion of the residency is devoted to preparation and presentation of a written management study.

COMPREHENSIVE EXAMINATION. Successful completion of a comprehensive examination, consisting of both oral and written phases, is a prerequisite qualification for the M.H.A. degree.

The Doctor of Philosophy

The Ph.D. degree is essentially a research degree. Although course work is a necessary part of the student's program, the mere accumulation of course credits will not be sufficient for attaining this degree. The granting of the Ph.D. is based primarily upon the student's knowledge of a specialized field of study and upon the production of an acceptable dissertation embodying the results of original research.

REQUIREMENTS FOR THE PH.D. DEGREE. The formal requirements, discussed in detail below, for the Ph.D. degree are as follows: (1) foreign languages; (2) major and minor courses; (3) supervisory committee for program of study; (4) residence; (5) pre-

liminary examination; (6) dissertation; (7) final examination. In order to be considered for candidacy for the Ph.D. degree, the student must have passed all of his course work in the first year of graduate study; on at least 9 units of course work he must have made a grade of *G* or better.

FOREIGN LANGUAGES. Normally, a reading knowledge of both French and German is required. (For methods of meeting this requirement, see p. 28.)

A student working toward the doctoral degree should complete the language requirements for that degree by the end of his first year of residence. If he fails to meet these requirements by the end of his third semester of residence, he must register in the appropriate special reading course or courses (see page 29) until he has satisfied the requirements.

MAJOR OR MINOR. The student's program of study necessarily demands substantial concentration on courses in his major department. It must, however, include a minimum of six units in a minor subject or related fields approved by his major department. Use of related fields within the major department requires the approval of the Dean of the Graduate School.

COMMITTEE TO SUPERVISE THE PROGRAM OF STUDY. As early in a student's course of study as is practicable and *not later than two months before the preliminary examination* the Director of Graduate Studies in the major department will nominate for the approval of the Dean a supervising committee of five, one being designated as chairman. This committee will include at least three members of the major department and one from the minor if a minor is involved. This committee will draw up a program of study and administer the preliminary examination and, with such necessary changes as are approved, the final doctoral examination. However, should all members of the committee be from the major department, at least one member of another department will be added or substituted for the final doctoral examination. The final examination may be administered with a minimum of four members.

When the preliminary examination is arranged, the committee and the Director will submit to the Dean the student's program of study bearing a statement that the Department's course and language requirements have been or are being completed.

RESIDENCE. For students who first registered in September 1959 or thereafter the *minimum* registration requirement is 60 units of graduate credit not more than 30 units of which may be accepted by transfer. Since a full program is 30 units per academic year, the prospective Ph.D. candidate who enters with the A.B. or B.S. degree

must plan to spend in residence a *minimum* of two academic years; if he enters with the A.M., his *minimum* residence is one academic year. (For the definition of *residence,* see page 24.) If there are undergraduate deficiencies in his program, he may in addition to the minimum requirements be required to take preliminary undergraduate courses for which he will not receive graduate credit. Even if there are no such undergraduate deficiencies, the student's supervisory committee will determine what requirements if any above the minimum the student must meet.

For requirement of registration see Normal Registration above, page 25.

TIME LIMITATIONS. 1) At the time that the preliminary examination is passed any courses, language certifications, or other credits for advanced standing which are more than six calendar years old will not be accepted toward fulfilling the minimum requirements of the doctoral degree.

2) The student should normally pass the preliminary examination by the end of his second year of graduate study. If he has not passed it by the middle of the third year, he must file with the Dean of the Graduate School a statement explaining the delay and setting a date for the examination. Except under unusual circumstances, extension will not be granted beyond the end of the third year.

3) The doctoral dissertation should be submitted and accepted within two calendar years after the preliminary examination is passed. Should the dissertation not be submitted and accepted within four years after the examination, the candidate, with the approval of his committee, may petition the Dean of the Graduate School for an extension of one year. Should this extension be granted and the dissertation not be submitted and accepted within the year, the student to remain a candidate for the degree must pass a second preliminary examination. In such a case, the time limit for submitting the dissertation will be determined by the Dean of the Graduate School and the candidate's committee.

CREDIT FOR SUMMER WORK. Credit earned in the Summer Session will not reduce the minimum required residence (see above, p. 24).

PRELIMINARY EXAMINATION. A student is not accepted as a candidate for the Ph.D. degree until he has passed the preliminary examination. A transfer student who may have passed a preliminary examination elsewhere must nevertheless take the examination in this Graduate School. The examination ordinarily covers both the major and minor fields.

Except in unusual circumstances approved by the Dean, a preliminary examination will not be scheduled between the last day of

the spring semester examination period and registration day in the fall semester.

PRIVILEGE OF RE-EXAMINATION. Should the student fail the preliminary examination, he may apply, with the consent of his supervisory committee and of the Dean of the Graduate School, for the privilege of a second examination to be taken no sooner than three months after the date of the first. Failure on the second examination will render the student ineligible to continue his program for the Ph.D. degree at Duke University.

THE DISSERTATION. The dissertation is expected to be a mature and competent piece of writing, embodying the results of significant and original research.

FILING TITLE. Not later than March 1 (March 2 if March 1 falls on Sunday) preceding the June commencement at which the degree is expected to be conferred, the student must file with the Dean of the Graduate School, on the official form to be obtained from the Graduate Office, the title of the dissertation. This title must receive the written approval of both the Director of Graduate Studies of the student's major department and the professor who directs the dissertation.

FORM. The basic requirements for preparing the dissertation such as quality of paper, form, and binding are prescribed in the instructions for microfilming (see below) and in the *Manual of Style for Theses and Dissertations,* revised 1961, to be obtained from the Duke University Book Store, West Campus.

SUBMITTING DISSERTATION. The dissertation must be completed to the satisfaction of the instructor who directs it. Four typewritten copies bound in snap binders obtained in the Library must be deposited with the Dean of the Graduate School on or before *April 15* preceding the June commencement when the degree is to be conferred. The dissertation must be submitted to the Graduate Office from seven to ten days before the scheduled date of the student's examination.

PUBLICATION ON MICROFILM. All doctoral dissertations will normally be published on microfilm through University Microfilms, Ann Arbor, Michigan. Authors may, if they wish, also copyright them. The abstract will be published in *Dissertation Abstracts. Before final typing is completed, the candidate should obtain in the Graduate Office detailed instructions on the procedure* together with a microfilming agreement which is signed and returned when the dissertation is finally deposited in the Graduate Office.

In brief, all copies of the dissertation, the original in clean type, will remain unbound except for spring binders. Ten copies of an *abstract,* carefully written and not more than 600 words long, are submitted

when the dissertation is first presented to the Graduate Office. A nonreturnable dissertation fee of $25 is charged for handling and microfilming. If copyright is desired, an additional fee is charged of $6 plus 2½ cents per page. The original copy and first carbon copy will be bound by the Ruzicka Bindery. The fee is $5.00 a volume. The student may request that more than the two copies be so bound.

FINAL EXAMINATION. The final oral examination shall be primarily on the dissertation. Questions may, however, be asked in the candidate's major field. Except in unusual circumstances approved by the Dean a final examination will not be scheduled between the last day of the spring examination period and registration day in the fall semester.

If a student fails his final examination, he may be allowed to take it for a second time, but not sooner than six months from the date of his first. Permission to take the second examination must be obtained from the instructor who directed the dissertation and from the Dean of the Graduate School. Failure to pass the second examination renders the student ineligible to continue work for the Ph.D. degree at Duke University.

The Doctor of Education

The Doctor of Education degree is a professional degree planned for those who are, or intend to become, school administrators, supervisors, directors of instruction, curriculum consultants, or college teachers of education.

ADMISSION. The candidate for the Ed.D. degree must meet the same requirements for admission to the Graduate School as the candidate for the Ph.D. degree. In addition to these uniform requirements, the candidate for the Ed.D. (1) must have had at least two years' experience in educational work; (2) must present strong letters of appraisal and recommendation from persons well qualified to speak with authority of his abilities; and (3) must present himself, if possible, for a personal interview. The Standing Committee on the Ed.D. degree reserves the right to insist upon an interview.

Persons who are primarily concerned with meeting requirements set by North Carolina for the advanced certificate for principals and supervisors must request and secure admission for doctoral study.

RESIDENCE, ETC. Regulations concerning residence requirements, grades required during the first year of graduate study, and the preliminary examination are the same as those for the Ph.D. (See pp. 36-39.)

FOREIGN LANGUAGES. There are no foreign language requirements for the Ed.D. degree.

PROGRAM OF WORK. The candidate for the Ed.D. degree will choose as his major field either Educational Administration and Supervision or Curriculum and Instruction.

Candidates in Administration and Supervision will take approximately 24 units in that field, including the seminar in School Administration. In addition, they will take approximately 18 units in other professional courses, and a minor of approximately 18 units approved by the candidate's supervisory committee and the Standing Committee on the Ed.D. degree.

Candidates in Curriculum and Instruction will take approximately 24 units in Curriculum and Instruction. In addition, they will take approximately 12 units in other professional courses, and a minor of approximately 24 units in the humanities, the natural sciences, or the social sciences, exclusive of professional education.

The program of work for each candidate must be approved by the Standing Committee for the Ed.D. degree.

DISSERTATION. The candidate must write a dissertation, for which the formalities of presentation, including its defense in a final examination, are the same as those for the Ph.D. degree. The type of dissertation will depend upon which of the following plans the candidate adopts:

Plan A. A candidate choosing Plan A will write a dissertation which is expected to be a mature and competent piece of writing, embodying the results of significant and original research. It must be, in essence, a contribution to knowledge.

Plan B. A candidate choosing Plan B will serve at least a year in an administrative post, or a teaching position in an elementary or secondary school, subsequent to the completion of all course requirements and a year of residence. His dissertation may be concerned with a problem, or several closely related problems, growing out of this experience. Although the dissertation written under Plan B is of a practical nature, it must demonstrate the candidate's ability to investigate and report on a significant phase of education in his major field.

PUBLICATION ON MICROFILM. The dissertation will be published on microfilm, as is the dissertation for the Ph.D. (See p. 39.)

FINAL EXAMINATION. Regulations for the final examination are identical with those of the Ph.D. degree. (See p. 37.)

Awards and Fees

Fellowships, Scholarships, and Assistantships

FOR the encouragement and financial assistance of graduate students of marked ability, Duke University has established a considerable number of fellowships, scholarships, and assistantships. The stipends for these range from $600 to $3,400. Holders of grants pay tuition and other fees regularly required of all graduate students.

Fellows and scholars pay full tuition and fees and are expected to register for a full schedule of course work each semester. In general, assistants register for a four-fifths program and pay 12 units tuition and fees per semester.

APPLICATION FOR AWARDS. Application for these awards, along with all supporting documents, must be submitted on or before February 15. Notification of awards is made about April 1. Late applications will be considered, should any vacancies occur in the list of appointees. No appointment is made for longer than one academic year.

Further information and application forms may be obtained from the Dean of the Graduate School, Duke University.

Awards offered for 1965-66 are:

FELLOWSHIPS: Approximately thirty James B. Duke Fellowships with stipends of $3,400; one Angier Duke Memorial Fellowship of $3,400; one Otis Green Foundation Fellowship in Humanities or Social Sciences of $2,500; four Gurney Harriss Kearns Fellowships in Religion ranging up to $2,800; University Fellowships ranging from $2,000 to $3,000.

UNIVERSITY SCHOLARSHIPS. The University offers a number of scholarships with stipends ranging from $600 to $1,800.

GRADUATE ASSISTANTSHIPS. Appointments as Departmental Assistants and readers carry a total stipend in the range of $1,000 to $3,200. The value of stipend is determined by the fraction of time given to assisting, the qualifications of the assistant, and the nature of work assigned.

RESEARCH ASSISTANTSHIPS. Appointments are for pre-doctoral candidates whose special training and qualifications enable them to serve as assistants to individual staff members in certain depart-

ments. Stipends range from $600 to $3,000 based on the assisting time required.

Appointments to qualified, advanced students as Research Associates, Research Fellows, and Research Scholars. Stipends range upward from about $1,800.

COKESBURY GRADUATE AWARDS IN COLLEGE TEACHING. These awards, sponsored by the Board of Education of the Methodist Church, are designed to assist graduate students who are committed to a Christian philosophy of higher education and who intend to teach in college. The applicant must have been a member of the Methodist Church for at least three years, and must have been accepted for or be currently pursuing a program of graduate studies at one of the Methodist-related universities, including Duke University, approved for this program. Awards, for one year, vary in amount from $600 to $2,500.

Application must be completed before February 15. For further information and application forms, apply to the Dean of the Graduate School.

CHARLES W. HARGITT RESEARCH FELLOWSHIP IN ZOOLOGY. The Charles W. Hargitt Research Fellowship in Zoology is devoted to the promotion of research in the field of cellular studies. It may be awarded to post-doctoral candidates or established investigators who desire to engage in research and to outstanding predoctoral candidates in support of their graduate training. The recipient will be expected to engage in full-time research or training and will have no departmental duties. Research facilities will be provided. Appointment is for one year with the possibility of reappointment.

Inquiries and applications should be addressed to the Chairman, Hargitt Fellowship Committee, Department of Zoology.

SHELL FELLOWSHIPS

IN ELECTRICAL ENGINEERING. This fellowship is established to encourage graduate studies leading to an M.S. or Ph.D. degree in electrical engineering. Preferential consideration is given to candidates in an advanced stage of their work toward the doctorate. This award provides for a single student or a childless married student a stipend of $2,000 per academic year, or $2,500 per 12 consecutive months of study; or for a married student with one or more children, a stipend of $2,600 per academic year, or $3,200 per 12 consecutive months of study. In addition, the Fellowship provides actual tuition and fees required of the recipient and a special allotment of $1,000 to the major department to be applied toward equipment and materials needed by the Fellow in his research. Appointment is for one year with the possibility of reappointment.

Inquiries and applications should be addressed to the Associate Dean for Graduate Study and Research, College of Engineering.

IN AFRICAN STUDIES. Two fellowships are available to qualified students in social sciences who are preparing for careers in the State Department, including the foreign services of the United States, the United Nations, or other international agencies, or in research and teaching in international affairs in academic institutions within the United States. They must be citizens of the United States or presently residing permanently in the United States and intending to become citizens. The fellowships are intended to cover the expenses of field research in the preparation of doctoral dissertations. The stipend for each fellowship is $4,000 plus a reasonable amount for transportation expenses. Inquiries should be made to the Executive Secretary, Commonwealth-Studies Center, Duke University.

EXCHANGE FELLOWSHIPS WITH THE FREE UNIVERSITY OF BERLIN. Duke University has an exchange arrangement with the Free University of Berlin which will provide fellowships for two graduate students to work during the regular academic year in Berlin. Departments will submit nominations to the Dean of the Graduate School before February 15.

PEACE CORPS FELLOWSHIPS. Three Peace Corps Fellowships may be offered to first-year applicants who have completed duty with the Peace Corps. Request for consideration for this award should be noted on the application for admission, which must be filed before February 15. Recommendation will be made by the major department. The stipend will be $3,000.

FELLOWSHIPS AND GRADUATE SCHOLARSHIPS IN FORESTRY. Information regarding special fellowships and graduate scholarships in forestry may be obtained from the Dean of the School of Forestry, Duke University, Durham, North Carolina.

FEDERAL FELLOWSHIP PROGRAMS. In 1964-65 Duke University was approved to offer programs sustained by National Defense Act Graduate Fellowships in Economics, History, Philosophy, Physics. Romance Languages, and Sociology, and Foreign Language Fellowships. The University is approved to recommend approximately twenty applicants for Cooperative Graduate Fellowships and Summer Fellowships for Graduate Teaching Assistants offered by the National Science Foundation, to offer NASA Predoctoral Traineeships in the space sciences, and NSF Graduate Traineeships.

PART-TIME INSTRUCTORS. A number of departments offering graduate work make use of exceptionally qualified graduate students as part-time instructors. These students are usually able to register for a graduate program of 9 units a semester. Inquiries con-

cerning such appointments should be directed to the Chairman of the Department concerned.

PAYMENTS TO HOLDERS OF AWARDS. Payments of stipends to all graduate students holding fellowships, scholarships, and graduate assistantships for the academic year are made by the Bursar of the University in eight monthly installments payable on the 21st of each month beginning October 21st. Arrangements may be made to prorate tuition charges on the same basis.

LOANS. The University has been allotted a sum for use under the provisions of the National Defense Act Loan fund. In addition, University funds are available to grant low-interest loans to deserving students of good academic standing. Application should be made to Mr. W. O. Petty, Jr., 102B Allen Building, Duke University.

Financial Regulations

The Graduate School awards such financial aid as fellowships, scholarships, and assistantships. The several departments engage part-time instructors who may be graduate students. The Treasurer of the University, however, has sole responsibility for paying stipends to students, collecting from them such fees as are due, and making special arrangements for prorating fees.

GENERAL FEES IN THE ACADEMIC YEAR. The following table shows the general fees and charges collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration for that semester. No student is admitted to classes until arrangements have been made with the Bursar of the University for the settlement of fees.

Tuition and general fees* ($40.00 per unit)	$600.00
Athletic Fee, not including federal tax, optional, per year, payable in the fall semester	15.00
Room rent (see detailed statement p. 46)	
Fee for Microfilming, payable by candidates for a doctoral degree when the dissertation is presented to the Graduate Office after the final examination	25.00
Fee for taking an ETS Foreign Language test, payable to the University Counseling Center	8.00

* General fees, in lieu of most special charges, include the following fees: Matriculation, Medical, Library, Damage, Commencement, Diploma, and an average of the Laboratory and Material Fees.

Tuition and fees for a full semester program of 15 units amount to $600.00. For a part program, tuition and fees are computed at the rate of $40.00 per unit.

SPECIAL FEES FOR TEACHERS AND OTHERS. The Graduate School recognizes a special obligation to encourage the following types of students in their professional and personal advancement:

(1) members of the faculties of the neighboring public schools and colleges, currently engaged in *full-time* teaching while taking courses in the Graduate School, (2) ministers of neighboring churches, (3) wives of Duke faculty members, (4) *full-time* employees of Duke University who are paid on a monthly basis throughout the year. The reduced fees do not apply to teachers and ministers while on leave of absence, nor to holders of fellowships, scholarships, or graduate and research assistantships, nor to part-time instructors.

Persons eligible for the reduced fee must meet the admission standards required of all graduate students and must be admitted to the Graduate School. They may enroll for one or two courses per semester (in no case totaling more than 7 units) upon payment of a fee of $5.00 for registration for each semester and a tuition fee of $15.00 per unit of credit or an audit fee of $15.00 per course. The *in absentia* fee will not be charged at this rate.

AUDIT FEE. In a semester in which a student registers and pays fees for 12 units or more, he may audit one course without charge. Should he be permitted to audit a second course or should he be registered for less than 12 units, the audit fee is $15.00 per course.

FEE ADJUSTMENT WITH CHANGE OF REGISTRATION. Arrangements made with the Bursar to prorate tuition and fee charges do not imply that the full amount is not due and payable on the date of fall and spring registration. During the fourteen-day period for change of registration (see Change of Registration, page 23) tuition and fees will be adjusted to necessary and approved changes. After the fourteen-day period no change of tuition and fees is possible.

STIPENDS AND INCOME TAX. Ordinarily stipends awarded under fellowships and scholarships are not subject to income and Social Security tax. However, a portion of the award to graduate assistants and research assistants may be subject to both. The Graduate Office will supply detailed information.

Living Accommodations

The Men's Graduate Center is available to men enrolled in the graduate and professional schools. The rooms are equipped for two persons and the rental charge for a double room is $125 per semester for each occupant.

Epworth Hall on the Woman's College Campus is available to women enrolled in the graduate and professional schools. The rental charge for a single room is $162.50 each semester. The rental charge for a double room is $137.50 per semester for each occupant.

Duke University Apartments are available for married graduate

and professional students. The 224 units are complete with basic furnishings. Rental rates per month currently are $70 for an efficiency apartment, $80 for a one-bedroom apartment, and $90 for a two-bedroom apartment. For further information on married student apartments, write to the Director of Housing, Duke University, Duke Station, Durham, North Carolina.

Rooms and apartments may be reserved for new applicants only if they have been accepted officially by the Graduate School of Arts and Sciences, and after the required $25 room or security deposit has been made with the Office of the Duke University Bursar. The initial room or security deposit is effective for reservations and is held until the room or apartment is vacated. Applications for rooms and apartments are to be made to the Director of Housing, Duke Station, Durham, North Carolina. Rooms are rented for the academic year, but for no period of less than one semester. Apartments are rented on a lease basis for specific periods, usually an academic year or longer.

No refund of residence hall room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

Regulations governing the occupancy of rooms and apartments will be supplied directly from the Director of Housing when the reservations are made. Occupants are expected to abide by these regulations.

DINING SERVICE. Food service on both the Woman's College Campus and the West Campus is cafeteria style. The cost of meals approximates $2.00 to $2.50 per day, depending upon the need and taste of the individual. The dining facilities on the West Campus include three cafeterias with multiple-choice menus, a grill, and, in addition, the Oak Room where full meals and a la carte items are served. The Men's Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 P.M. The prices are the same as in the West Campus Union. Because of the large number of those served in the dining halls, it is not possible to arrange special diets for individual students.

MEDICAL CARE. The complete medical facilities of the Duke University Medical Center are available to all members of the University community. To secure the benefits of the Student Health program, a graduate student during the term or semester in which the illness occurs must 1) in the Summer Session term be registered for at least 1 unit research or 3 units of course work, 2) prior to completing minimum residence requirements be registered for at least 9 units per semester and thereafter according to the schedule on pp. 25 and 26. Students are not covered during vacations and their dependents and members of their family are not covered at any time. Care is

provided for men at the Student Health Office in Duke Hospital and for women at the Woman's College Infirmary.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions, and elective surgery.

Graduate students are urged to carry adequate health insurance to supplement Student Health Program services. If students have insurance providing hospitalization, surgical, or medical benefits, the benefit shall be applied to the cost of their medical care.

Students whose course-load entitles them to full coverage under the Student Health program are eligible for a complementary insurance policy which then comprises protection for the entire calendar year. Concerning this complementary policy inquire of the Dean of the Graduate School. *Foreign students are required to hold this or another acceptable policy.*

MOTOR VEHICLES. Each student possessing or maintaining a motor vehicle at Duke University shall register it annually at the beginning of the fall semester. If a student acquires a motor vehicle and maintains it at Duke University after enrollment, he must immediately register it. At the time of registration of a motor vehicle the following documents must be presented:

(a) State vehicle registration certificate.

(b) Valid driver's license.

(c) Satisfactory evidence of automobile liability insurance coverage with limits of at least $5,000 per person and $10,000 per accident for personal injuries, and $5,000 for property damage, as required by the North Carolina Motor Vehicle Law.

(d) If the student is under 21, a statement signed by the student's parent or guardian granting the student permission to operate a motor vehicle at Duke University.

STUDENT ACTIVITIES. Graduate students new to Duke University may be reminded that they are welcomed to use such recreation facilities as swimming pools, tennis courts, golf course, and to affiliate wth choral, drama, and religious groups. They may become junior members of the American Association of University Professors and may affiliate with Phi Beta Kappa and social fraternities.

THE DUKE UNIVERSITY COUNSELING CENTER. Through the counseling center, the University provides a professional counseling service designed to aid students in gaining a better understanding of

themselves and the opportunities available to them. Counseling is available in the areas of career planning, educational opportunities, and personal and social adjustment.

The Center maintains files of educational and vocational information related to career planning, graduate educational programs and fellowships, and study aids.

National and University-wide testing programs are administered by the Center. A continuing program of research in the areas of counseling and testing is also carried on by the staff of the Center.

APPOINTMENTS OFFICE. Duke University maintains an active Appointments Office which has steadily been placing students in teaching and industrial positions. The services of this office are available without charge to graduate students. Those who are interested in securing employment through the Appointments Office, or those who wish to have available for their own use in securing employment a complete file containing their academic record and pertinent recommendations, should register in this office.

ESTIMATED EXPENSES IN THE ACADEMIC YEAR. The necessary expenses of a graduate student are moderate. The University dormitories and Unions provide comfortable and wholesome living conditions at a minimum cost. Incidental expenses for recreation, traveling, clothes, and other items naturally depend on the tastes and habits of the individual. The table below lists the necessary *college* expenses for one academic year for a full program of work:

	Low	*Moderate*	*Liberal*
Tuition and fees	$1200.00	$1200.00	$1200.00
Room Rent	225.00	250.00	275.00
Board	475.00	525.00	550.00
Laundry	30.00	40.00	50.00
Books	30.00	40.00	50.00
	$1960.00	$2055.00	$2125.00

Facilities for Graduate Study

The Libraries

THE University Libraries contain 1,650,000 volumes. In addition to the collections in the General Library, there are eight school and departmental libraries: Divinity, 112,845 volumes; Engineering, 33,202 volumes; Law, 134,424 volumes; Medical, 67,088 volumes; Woman's College, 144,377 volumes; Biology-Forestry, 81,258 volumes; Chemistry, 20,984 volumes; Mathematics-Physics, 27,740 volumes. In 1963-64, 71,018 volumes were added; 7,300 periodicals and 130 newspapers are received currently.

The General Library building, which was doubled in size in 1949, incorporates many modern arrangements for the preservation of the collections and for the convenience of the research scholar. Construction on an extension of the general library facilities, designed to provide twice the existing space, will begin early in 1965. Book stacks, storage areas, and quarters for rare books and manuscripts are air-conditioned. In the stacks, 274 carrels are available to graduate students as places of study, and a large reading room on the first floor of the building is reserved for graduate students. Upon application, graduate students may receive permit cards entitling them to use of the stacks.

A division of photographic services, with the most modern cameras and other equipment for microfilming or other photographic reproduction of printed and manuscript materials, provides a battery of reading machines to serve the Library's large collection of microfilms of rare books, periodicals, and newspapers.

The extensive resources of the Library for research students may be suggested by the following special collections:

THE TRENT COLLECTION OF WALT WHITMAN, containing the first and all other important early editions or issues of *Leaves of Grass*; books and articles of Whitman biography and criticism; nearly 300 manuscripts and 400 letters; and pictures, sheet music, and other miscellanea.

THE GEORGE WASHINGTON FLOWERS COLLECTION of books, manuscripts, pamphlets, and newspapers on all phases of Southern history.

THE ARENTS COLLECTION of several hundred volumes relating to the culture and production of tobacco and the manufacture and distribution of tobacco products.

THE JAMES A. THOMAS COLLECTION of books on Chinese history and culture.

THE GUIDO MAZZONI LIBRARY, a collection of approximately 23,000 volumes and 67,000 pamphlets covering the whole range of Italian literature, with special strength in the nineteenth century.

THE GUSTAVE LANSON LIBRARY of 12,000 books and monographs on French literature.

LATIN-AMERICAN COLLECTIONS, built around a special Peruvian library of 7,000 books and manuscripts, a Brazilian library of several thousand volumes, and an Ecuadorian library of 2,000 volumes, supplemented by strong collections of the public documents of these and other Latin-American countries.

THE ROBERTSON LIBRARY of Philippiniana.

THE FRANK C. BROWN FOLKLORE COLLECTION, consisting of about 38,000 manuscript pieces, 1,400 vocal recordings, and 650 musical scores of North Carolina folklore.

THE STRISOWER LIBRARY of International Law, numbering about 5,000 volumes, with many rare books and periodical files.

THE TRENT COLLECTION IN THE HISTORY OF MEDICINE (Medical Center Library), containing about 3,000 books and 2,500 manuscripts with special strength in anesthesia, anatomy, English medicine, vaccination, yellow fever, pharmacy, and medical biography.

THE HOLL CHURCH HISTORY LIBRARY, dealing primarily with the period of the Reformation.

THE FRANK BAKER COLLECTION OF WESLEYANA AND BRITISH METHODISM, consisting of 1,500 editions of the works of John and Charles Wesley, 8,000 volumes concerning all phases of the development of British Methodism, 4,000 volumes relating to the religious and social background of British Methodism, and 4,000 manuscript pieces by the Wesleys and their coadjutors and by British Methodists of the last 200 years.

COLLECTIONS IN ENGLISH AND AMERICAN LITERATURE, where emphasis has been placed principally on the eighteenth and nineteenth centuries, with the collections of Swinburne, Tennyson, Rossetti, and Bryant, significant groups of annotated copies and first editions of Coleridge and Byron, the Carroll Wilson collection of Emerson, some 5,000 items of eighteenth-century English poetry and prose, and the Paul Hamilton Hayne library of American literature.

In addition to these and other special collections, the Libraries contain excellent files of United States federal and state documents, public documents of many European and Latin-American countries, and publications of European academies and learned societies. The

newspaper collection, with 13,250 volumes and 12,550 reels of microfilms, has several long eighteenth-century files, strong holdings of nineteenth-century New England papers, and of ante-Bellum and Civil War papers from North Carolina, South Carolina, and Virginia; there are also many European and Latin-American papers. The manuscript collection of 3,817,064 items is particularly strong in all phases of the history, politics, and social and economic life of the South Atlantic region, though it includes also significant papers in English and American literature, and several notable medieval manuscripts in both Greek and Latin.

Science Laboratories

BOTANICAL AND ZOOLOGICAL LABORATORIES. Facilities for graduate study in the Departments of Botany and Zoology are located on the West Campus. A new Biological Sciences building, completed in 1962, contains well-equipped modern laboratories for teaching and research in the various fields of botany, forestry, and zoology. Special facilities are available, such as animal rooms, greenhouses, darkrooms, refrigerated and controlled environment laboratories, electron microscope, Van de Graaff accelerator, X-ray machine and other radiation and radioisotope equipment, and other modern research facilities. A large "phytotron" is under construction.

The Botany Herbarium, containing over 310,000 specimens, is world-wide in scope and includes notable collections of mosses and lichens. The Biology-Forestry Library contains an outstanding collection of books and periodicals. The Library currently subscribes to over 800 journals and has 85,000 volumes. Unique assets for teaching and research are the Sarah P. Duke Gardens, conveniently located on the West Campus; the Duke Forest, comprising 7,000 acres of woodland adjacent to the West Campus; the Field Station for the Study of Animal Behavior; and the Duke University Marine Laboratory at Beaufort, North Carolina.

Scholarships for advanced study during the summer months are maintained at the Highlands Laboratory, Highlands, North Carolina, at the Marine Biological Laboratory, Woods Hole, Massachusetts, and at the Duke University Marine Laboratory. Requests for information concerning scholarships at the Highlands Laboratory should be addressed to the Botany Department, those at Woods Hole to the Zoology Department, and those at Beaufort to the Duke University Marine Laboratory.

MARINE LABORATORY. The Duke University Marine Laboratory is located at Beaufort, North Carolina, one and one-half miles from the open ocean. The physical plant includes five well-equipped research buildings, class rooms, and dormitories. The Lab-

oratory provides excellent facilities for graduate courses in botany and zoology and for thesis research throughout the year. Special research and training facilities for field work in marine biology and biological oceanography include two motor vessels and a new 118-foot biological research vessel *Eastward*, with a broad array of excellent apparatus for collecting and environmental measurements.

Six National Science Foundation Predoctoral Traineeships in biological oceanography and two Bureau of Commercial Fisheries Educational Grants in marine biology are available to advanced graduate students during the academic year. In the summer of 1965 twelve National Science Foundation Predoctoral Awards will be offered for course or research work in marine biology at the Marine Laboratory. For information concerning awards, courses, and research space, write to the Director, Dr. C. G. Bookhout, Duke University Marine Laboratory, Beaufort, North Carolina.

ANIMAL BEHAVIOR STATION. Located less than one mile from the campus, the 75 wooded acres of the Station provide facilities for studies of penned and free-ranging, and caged animals. These facilities include sound-proof observation chambers, barns, aviaries, and pens for large mammals and birds, and two water-fowl ponds. A permanent facility for pro-simian primates (both simulated "natural habitats" and cages) are under construction. For information regarding research space or research assistantships in Behavior, write to Dr. P. H. Klopfer, Dept. of Zoology, or Dr. D. K. Adams, Dept. of Psychology.

PHYSICAL LABORATORIES. The Physics Building, comprising about 130,000 square feet of floor space, is devoted to the research and instruction of the Departments of Physics and Mathematics.

In addition to the lecture halls and the elementary laboratories, the building includes special laboratories for work in electronics, microwaves, optical spectroscopy, atomic, nuclear, high energy, and low-temperature physics. Special research equipment includes a 21-foot concave grating and other instruments for visible, ultraviolet, and Raman spectra; facilities for research in microwave spectroscopy and other high-frequency phenomena; two Van de Graaff accelerators, one 4 MEV and one high intensity 3 MEV, and associated equipment for nuclear physics research; a helium liquifier, other low temperature equipment, and three large electromagnets for nuclear resonance research below 1° Kelvin; A DDP-24 control computer which is used on-line with two conventional projection microscopes to measure bubble chamber tracks of high energy particles.

The Physics Building contains the Mathematics-Physics library, an IBM 7072 computer, and a shop staffed by ten instrument makers, six electronics technicians, and a glass blower.

CHEMISTRY LABORATORIES. The Chemistry Building has a floor area of approximately 57,000 square feet, of which more than half is devoted to advanced teaching and research. Modern instruments are available for routine measurements, as well as for research involving ultraviolet, visible, and infrared spectroscopy. Also provided are two nuclear magnetic spectrometers, one for routine analytical purposes, and the other, a high resolution instrument, for research. In addition to extensive equipment for X-ray crystallography, facilities are available for electron spin resonance measurements, polarography, light scattering, and mass spectrometry.

Well-equipped shops, with a mechanic and an electronics technician, provide facilities for the construction of special apparatus and for repair and maintenance of instruments.

The Chemistry Library, conveniently located in the building, has on its shelves over 20,400 volumes, and currently subscribes to over 200 scientific periodicals.

PSYCHOLOGY LABORATORIES. The Psychology Department occupies new and fully renovated quarters, comprising about 53,000 square feet of floor space, which house its main laboratories, seminar rooms, classrooms, and special facilities. The building is completely air-conditioned for year-round research and study. For the use of graduate students and staff, the Department houses a periodical reference room with an extensive collection of current and bound journals and monographs in psychology and related subjects. In addition to general purpose laboratories, there are special facilities for animal behavior studies; sound-proofed and electrically-shielded rooms for use with human and animal subjects; specially equipped rooms for the study of visual perception; electrophysiological recording rooms; a histological laboratory and surgery; photographic dark rooms, etc. The social psychology unit (joint with the Department of Sociology) contains observation, communication, and recording facilities for the study of social interaction. There is an extensive suite of interview and observation rooms for the study of human personality and clinical processes. An on-line digital computer is located in the animal behavior laboratories, and automatic computation equipment is available for all research purposes. A departmental shop, with competent technicians in charge, is maintained to provide specialized mechanical and electronic apparatus. Other facilities for research and teaching are available in the laboratories and clinics of the adjacent Duke Medical Center.

A number of clinical installations for adults and children, devoted to an extensive range of clinical and guidance problems, cooperate with the department in providing facilities for research and training. In addition, the Department operates a Preschool Laboratory for four-

and five-year old children. The Department cooperates with the Department of Zoology in the operation of a 75-acre field station in the near-by Duke Forest for the study of animal behavior in natural settings. (See p. 53, Animal Behavior Section.)

COMPUTING LABORATORY. Since 1958 an IBM electronic computer has been available in the Computing Laboratory for instruction in modern computing methods and for research. The Computing Laboratory is under the guidance of the Department of Mathematics and is located in the Physics Building. It is being used for research in the physical sciences, engineering, mathematics, and in the biomedical and social sciences. The Laboratory is currently equipped with an IBM 1401-7072 system. This system offers many of the most recent advances in computing equipment. Suitable auxiliary machines for processing punched cards are also provided.

Engineering Laboratories

The instructional and research laboratories, together with the library, classrooms, shops, and offices, are located in the Engineering Building on the West Campus. Engineering laboratories of particular interest to graduate students are these:

Civil Engineering: experimental stress analysis; hydrodynamics; materials science; sanitary engineering; soil mechanics; and structural mechanics.

Electrical Engineering: solid-state materials; ferromagnetics; superconducting circuits; electronics; analog computer; automatic control; energy conversion; spacecraft electrical systems; and spacecraft telemetry systems.

Mechanical Engineering: heat transfer, fluid mechanics, environmental thermodynamics; response of physical systems; and vibration studies.

These facilities are described in the *Engineering Bulletin.*

Duke Forest

The Duke Forest consists of approximately 7,000 acres of land, most of which is adjacent and easily accessible to the University campus. Situated in the lower Piedmont region and composed of second-growth shortleaf pine, loblolly pine, and hardwoods, the Forest is representative of the various types of timber growth and soils found throughout the region. Through placing the Forest under intensive management for forestry purposes, substantial progress has been made in developing the educational work and research in forestry.

The proximity of the Forest to the laboratories, greenhouses, and library facilities of the University provides an excellent opportunity for advanced study and research in forestry. Research, particularly in the fields of silvics, forest soils, silviculture, forest management, properties of wood, forest-tree physiology, forest entomology, and forest pathology, is well under way. Several members of the botany and zoology staffs are also engaged in research in the Duke Forest.

Forest Sciences Laboratory

The establishment of the Forestry Sciences Laboratory research facility of the Southeastern Forest Experiment Station in the Research Triangle Park near Durham provides an unusual opportunity for complementing the research programs of students in the Department of Forestry. Specialized research projects in forest entomology, pathology, physiology and soils are currently under way at the Laboratory. The staff of the Laboratory is available for consultation, participation in seminars and may offer advice to students conducting research in the Department of Forestry. Arrangements may also be made for students to conduct certain aspects of their research at the Laboratory.

Commonwealth-Studies Center

The Commonwealth-Studies Center was established at Duke University in 1955 and has received financial support from the Carnegie Corporation of New York, the Rockefeller Foundation, and the Ford Foundation. Its objectives are:

1. to encourage and stimulate by financial assistance and other means the research interests of individual scholars in Commonwealth fields,
2. to establish at Duke University a Center whose facilities will promote interest in research relating to the Commonwealth, provide the materials for basic research, and encourage research by Commonwealth and American students and faculty.

The Center awards fellowships to graduate students from Australia, Canada, and New Zealand who propose to study for the Ph.D. degree in economics, history, or political science at Duke University. National selection committees in each of the mentioned countries facilitate the selection of fellows.

Each spring the Center sponsors a joint seminar for graduate students in economics, history, and political science. In addition the Center sponsors occasional lectures at the University by distinguished Commonwealth scholars.

Financial assistance is provided to students and faculty at the University for field research in Commonwealth countries. Studies resulting from research sponsored by the Center are frequently published by the Duke University Press in the Commonwealth-Studies Series. The Center also distributes in its reprint series selected published articles that relate to the Commonwealth.

Program in Comparative Studies on Southern Asia

The Program in Comparative Studies on Southern Asia was established at Duke University in 1961 following a grant from the Ford Foundation to the Commonwealth-Studies Center to enable it to develop a research and training program on that area. The basic purpose of this program is twofold: to facilitate research on the political and economic development of Commonwealth countries of Southern Asia (India, Pakistan, Ceylon, Malaysia and Brunei) and to provide for the systematic training of graduate students in economics, history, political science, and sociology-anthropology with special emphasis on the area.

The graduate student, in addition to meeting the requirements of the department in which he is enrolled, is expected to take Hindi-Urdu and the cognate courses in other departments and to undertake field research in the preparation of his dissertation. (Chinese is offered at the University of North Carolina.)

The Program awards each year a limited number of pre-doctoral fellowships for graduate studies in the discipline and under the expectations listed above. Awards carrying the same expectations are also made under the NDEA Title VI language fellowships offered by the U. S. Office of Education.

Facilitation and support of research activities by members of the Duke University faculty and graduate students is an important aspect of the Program's activities. It supports through travel grants and subsistence allowances field research by persons affiliated with the University. Research grants for faculty and students are also available from the American Institute of Indian Studies, the United States Office of Education, and the Social Science Research Council. Research facilities include those materials received as a result of the University's participation in a library acquisitions program under the terms of Public Law 480.

The Program has undertaken the publication of two series, one of hard-cover monographs, the other of reprints of articles of note dealing with the Southern Asian region. A third series of occasional papers is proposed.

Hispanic Studies Program

The Graduate School offers an inter-departmental program of Hispanic studies leading to the A.M. and Ph.D. degrees. Students may write their theses and take their degrees in history, economics, political science, sociology, and Hispanic languages and literatures. The purpose of the program is to make possible desirable combinations of courses on the Hispanic world in these related disciplines and to bring to bear more strength of the faculty upon the training of a single candidate. This may be achieved through a judicious use of minors or by such special arrangements as may from time to time become necessary.

The Duke University Library holdings have been built up to facilitate graduate work and research in Hispanic-American cultural history, inter-American relations, economic history, politics, and Spanish-American literature. These collections are being constantly enlarged.

The Population Studies Program

The Population Studies Program at Duke University was established in 1963 as a joint enterprise of the Departments of Economics and Sociology and was charged with both educational and research functions in the area of Demography and Human Ecology.

Training under the auspices of the Program leads to a Ph.D. degree within the Departments of Sociology or Economics with a specialization in Population Studies. Two training regimes are available, one in each department. Each is designed to provide an integrated and cross-disciplinary training in the common speciality area of Population Studies.

In addition to cross-departmental courses, program unity is found through a Population Studies Seminar. This Seminar, which is non-credit and informal, is attended by advanced students and by faculty in both departments. The Seminar provides briefing on demographic research conducted by both faculty and students in the two departments. It also serves as a vehicle for a number of visiting lecturers in demography each semester.

Graduate fellowships for students in the Program are available in either of the two departments.

Oak Ridge Institute of Nuclear Studies

Duke University is one of the sponsoring universities of the Oak Ridge Institute of Nuclear Studies located at Oak Ridge, Tennessee.

The graduate research program at Duke has available to it all the facilities of the Oak Ridge National Laboratory and the cooperative supervision of student research by the staff at Oak Ridge.

Fellowships in several fields of science are available to qualified applicants.

GRADUATE FELLOWSHIP PROGRAM. On application by a university the Institute awards fellowships to candidates for the master's and doctor's degree. The student uses the fellowship to conduct his thesis research in an Oak Ridge laboratory.

AEC SPECIAL FELLOWSHIPS. These are available in the fields of (1) Nuclear Science and Engineering, (2) Health Physics, (3) Advanced Training in Health Physics, and (4) Industrial Hygiene.

The application deadlines differ for different fellowships. Further information may be obtained from Karl M. Wilbur, Department of Zoology.

Cooperative Programs with the Consolidated University of North Carolina

INTERCHANGE OF REGISTRATION. (See pp. 24-25.)

LIBRARY EXCHANGE. Students of both the University of North Carolina and Duke University are granted certain library privileges in the respective libraries of each University. Books unavailable in one library may be procured at short notice through an interlibrary loan service.

THE COOPERATIVE PROGRAM IN THE HUMANITIES. The Cooperative Program in the Humanities, jointly managed by Duke University and the University of North Carolina at Chapel Hill, aims at expanding and improving activities in the humanities in the two universities and throughout the region. The Program was established in 1963, with offices on both campuses, and receives substantial financial support from the Ford Foundation.

The central feature of the Program is a cooperative exchange between the two universities, on the one hand, and a number of liberal arts colleges on the other. Academic-year research leaves are made possible for faculty members from humanistic departments of liberal arts colleges located in Virginia, North Carolina, and South Carolina. These scholars are known as Humanities Fellows. Each Fellow has an important, clearly defined research project. As partial replacements for the Humanities Fellows during their year of leave, the Program offers to the colleges advanced graduate students from the two universities.

The Program sponsors semester visits of distinguished professors in the Humanities. In addition to teaching, these Professors also give occasional public lectures on both campuses. The Program also makes possible shorter visits by well-known foreign humanistic scholars.

The Program has established two editorial internships, filled by advanced graduate students. These graduate students have the opportunity to become familiar with the processes and technical aspects of scholarly publication.

Each spring the Program will sponsor a humanities symposium. Representatives of colleges in the region and several outstanding humanists from other regions will participate, along with all persons directly involved in the Program.

The Program will conduct two summer activities: (1) The Southeastern Institute of Medieval and Renaissance Studies has been established for the advancement of scholarship and the improvement of teaching in the southeastern region. The first Institute will consist of seven informal seminars, each led by a Senior Fellow. Each seminar will have an enrollment of six faculty members from colleges in the southeastern region. Students of all areas of medieval and renaissance studies are invited to participate. (2) A number of Summer Research Awards are available for faculty members at Duke and the University of North Carolina.

Inquiries may be directed to the Program office, 212 Building 9, Duke University.

COOPERATIVE PROGRAM IN RUSSIAN AND EAST EUROPEAN HISTORY. The graduate schools of Duke University and the University of North Carolina offer a cooperative program leading to the M.A. and Ph.D. degrees in Russian and East European history. Students admitted to one institution are encouraged to enroll in those courses in the other that are advantageous to their programs, and to utilize the libraries and facilities of both universities. The holdings of the two libraries in Russian and East European history are substantial and complementary. Both libraries have a policy of purchasing all significant published works in Slavic history, economics, government, geography, literature, and linguistics. Graduate assistantships and fellowships of various types complete the program.

Research and Publications

The several departments of the University are devoted to research as well as to instruction. Since the University exists for the promotion and diffusion of knowledge, attention is rightly placed, in the Graduate School, on research activities.

In furtherance of the University's obligation to promote and diffuse knowledge, the President annually appoints a University Council on Research, which receives applications from members of the various faculties for subsidies in support of research. Vigorous and forward-looking policies of this Research Council have initiated and encouraged the completion of many substantial and important research projects.

The Duke University Press takes its place as a significant agency in the diffusion of knowledge. Created in 1925, as a successor to the Trinity College Press, the Duke University Press continued the publication of the *South Atlantic Quarterly*, published at Trinity College since 1902, and in 1926 revived the *Hispanic-American Historical Review*, which had been founded and published from 1918 to 1922 by a group of scholars interested in Hispanic America. In 1929 *American Literature* was begun with the cooperation of the American Literature Group of the Modern Language Association. This journal was followed in 1931 by *Ecological Monographs*, and in 1932, *Character and Personality* (since 1945 the *Journal of Personality*). In 1935 the Press began the publication of the *Duke Mathematical Journal*. Since 1948 it has published *Ecology*, the official journal of the Ecological Society of America. The Law School of Duke University publishes *Law and Contemporary Problems*, *The Duke Bar Journal*, and *The Journal of Legal Education*.

The Press, since its organization, has published more than three hundred and twenty-five volumes, including four series of monographs, and has thus made public the fruits of scholarly research of the Duke faculty and of scholars elsewhere. In the broadest sense, the policy of the Press is to make available to the public any scholarly work that merits publication though special attention is given to works in domains of knowledge cultivated by the University.

Visiting Scholars

The libraries and, to the extent practicable, other facilities of Duke University will be made available to faculty members of colleges and universities who wish to spend a period of time on the campus in pursuit of their scholarly interests. No fees will be charged such visitors unless they wish to participate in activities for which a special fee is assessed. Room and board may be arranged for at the regular rates in the dormitories and dining rooms. Dormitory space is usually available during the summer months. Inquiries concerning residence for visiting scholars should be directed to the Dean of the Graduate School of Arts and Sciences.

Graduate Study in the Summer Session

The Summer Session of Duke University is divided into two terms. In 1965 the first term will begin on June 12 and will end on July 17. The second term will begin on July 19 and will end on August 24.

Graduate students who wish to work toward advanced degrees in the Summer Session, particularly in chemistry, economics, education, English, history, mathematics, religion, sociology, Spanish, and zoology, will find a selection of courses offered by members of the Duke faculty and by visiting professors. Other departments ordinarily offering work leading to the A.M. degree are botany, political science, and psychology. Thesis research for advanced graduate students is available also in other departments, such as botany, engineering, forestry, and physics.

Requirements for admission to the Graduate School are detailed above. Students who wish to be admitted to the Graduate School for work in the Summer Session should make application to the Dean of the Graduate School, as well as to the Director of the Summer Session, and should return the completed application, with supporting documents, before May 14, for admission to the first term, and before June 20, for admission to the second term.

REGULATIONS REGARDING SUMMER WORK. (a) No graduate student may register for more than six units of credit in one Summer Session term. (b) All of the work required for the A.M., M.A.T., or M.Ed. degree must be completed within six years of the date of beginning. (c) Not more than one year of summer work can be accepted toward the residence requirements beyond the minimum for the Ph.D. or Ed.D. degrees. See p. 26 for a definition of a year's residence credit earned in Summer Sessions. Students who complete in a summer session the work required by the University for the Master's degree will be granted the degree at the end of the summer.

A Summer Session Bulletin containing information about graduate courses may be obtained by addressing a request to the Director of the Summer Session, Duke University, Durham, N. C.

Courses of Instruction

In general, courses with odd numbers are offered in the fall semester, those with even numbers in the spring semester. Double numbers separated by a hyphen indicate that the course is a year-course and must normally be continued throughout the year if credit is received. A student must secure written permission from the instructor in order to receive credit for either semester of a year-course. Double numbers separated by a comma indicate that although the course is a year-course, credit may be received for either semester without special permission.

Normally, courses which bear no date are offered every year; those marked with an asterisk are offered only when the need arises.

Note: In each department the number 399 is reserved to designate special (individual readings in a specified area and supervised by a regular member of the Graduate staff, credit 1-3 units each registration, 9 units maximum in three successive registrations. The course is restricted to resident doctoral programs, should have a completion exercise, and must carry a grade. When used it appears in this form: [Department] 399, Special Reading in [area], (Instructor), [1 to 3] units.

ANATOMY

PROFESSOR MARKEE, CHAIRMAN; ASSOCIATE PROFESSOR DUKE, DIRECTOR OF GRADUATE STUDIES—431 MEDICAL SCHOOL; PROFESSORS EVERETT, HETHERINGTON AND PEELE; ASSOCIATE PROFESSORS BECKER AND MOSES

The Department of Anatomy offers graduate courses and training leading to the A.M. and Ph.D. degrees. Further information may be obtained from the Director of Graduate Studies of the department.

M201. ANATOMY AS RELATED TO LOCOMOTION.—Complete dissection of that part of the body concerned with locomotion and posture. (See also Course M205). September to January. Prerequisite: One year each of biology, chemistry, and physics. 6 units.

PROFESSORS MARKEE AND EVERETT; ASSOCIATE PROFESSORS BECKER AND DUKE

M202. MICROSCOPIC ANATOMY.—Conferences and laboratory work on the morphological characteristics of the tissues of the animal body. The work is based upon a study of fresh and prepared material and is approached from the physiological viewpoint. Sept. to Jan. Hours and credits (maximum 3 units) by arrangement. Prerequisite: adequate training in histology or cytology.

PROFESSORS MARKEE, HETHERINGTON, AND EVERETT; ASSOCIATE PROFESSORS BECKER, DUKE, AND MOSES

M203. ANATOMY OF THE NERVOUS SYSTEM.—A study of the gross and microscopic structure of the human central nervous system, special attention being paid to the structural and functional relationships between the various nuclei and fiber tracts. Feb. to June. Hours and credits (maximum 4 units) by arrangement. Prerequisite: Anatomy M201. PROFESSORS MARKEE, EVERETT, AND PEELE; ASSOCIATE PROFESSORS BECKER AND DUKE

M204. NEUROANATOMICAL BASIS OF BEHAVIOR.—A study of the gross and microscopic anatomy of the nervous system with emphasis on the structural and functional relationship between tracts, nuclei, and cortical areas. Restricted to graduate students with the equivalent of a major in psychology. (Jan. to June) 3 units. PROFESSORS HETHERINGTON AND PEELE

M205. ANATOMY OF THE VISCERA.—This is a study of the gross anatomy of the thoracic, abdominal and pelvic organs and the deeper structures of the head.

This course may be taken concurrently with M201. Sept. to Jan. Prerequisites one year each of physiology, chemistry, and physics. 2 units.
PROFESSORS MARKEE, EVERETT; ASSOCIATE PROFESSORS BECKER AND DUKE

M301. GROSS HUMAN ANATOMY.—A course especially for Ph.D. candidates in Anatomy, comprising a complete dissection of the cadaver. The laboratory work is supplemented by conferences which place emphasis on the biological aspects of the subject. Sept. to June. Hours and credits (maximum 8 units) by arrangement. Prerequisite: adequate training in comparative anatomy and embryology.
PROFESSORS MARKEE AND EVERETT; ASSOCIATE PROFESSORS BECKER AND DUKE

M312. RESEARCH.—Individual investigations in the various fields of anatomy. Credits to be arranged. PROFESSORS MARKEE, EVERETT, HETHERINGTON, AND PEELE; ASSOCIATE PROFESSORS BECKER, DUKE, AND MOSES

M313-314. ANATOMY SEMINAR.—Weekly meeting of graduate students and staff in which current research problems in Anatomy will be presented. Required of all graduate students who are candidates for the A.M. or Ph.D. degree. 2 units. Sept. to Jan. PROFESSORS MARKEE, EVERETT, HETHERINGTON, AND PEELE; ASSOCIATE PROFESSORS BECKER, DUKE, AND MOSES

ART

PROFESSORS HALL AND PATRICK; VISITING PROFESSOR BIER; ASSOCIATE PROFESSORS MARKMAN AND SUNDERLAND

No graduate degree is offered in this department, but the following courses are suggested as possible minors for students majoring in history, literature, philosophy, religion, psychology, or sociology, or in any other interested department.

215. RELIGIOUS ART OF THE ANCIENT NEAR EAST.—A specialized study of the development of art, particularly architecture and sculpture, as the material expression of religious ideas in Egypt, Mesopotamia, and in part of Syria and Palestine, to the Persian conquest. 3 units.* (W) ASSOCIATE PROFESSOR MARKMAN

216. RELIGIOUS ART OF THE CLASSICAL WORLD.—A specialized study of the religious art, particularly architecture and sculpture, of Greece and Rome, with special emphasis on the monuments in the Near East. 3 units.* (W)
ASSOCIATE PROFESSOR MARKMAN

217. AEGEAN ART.—A study of the problems of Aegean art as the forerunner of Greek art and in relation to the contemporary civilization of the eastern Mediterranean world. 2 units. (W) ASSOCIATE PROFESSOR MARKMAN

218. EARLY GREEK ART.—A study of the problems of the origin and development of Greek art in the Geometric period to the end of the Archaic. 3 units. (W)
ASSOCIATE PROFESSOR MARKMAN

221-222. HISTORY OF AESTHETICS.—Theories of art and beauty in the western world from antiquity to the present. Some attention will be given to the developed theories of aesthetics in the Far East. 6 units. (E) PROFESSOR PATRICK

233. EARLY MEDIAEVAL ARCHITECTURE.—The development of religious architecture from the time of Constantine to the end of the First Romanesque style in the third quarter of the eleventh century. 3 units. (E)
ASSOCIATE PROFESSOR SUNDERLAND

234. ROMANESQUE SCULPTURE.—The development of sculpture in western Europe from the early Christian period through the culmination of Romanesque art in the west portal of Chartres Cathedral. 3 units. (E)
ASSOCIATE PROFESSOR SUNDERLAND

239. ARCHITECTURE OF BRITAIN.—After a summary of recent archaeological activity in the British Isles, and a survey of Mediaeval building, the course deals principally with changing architectural problems and their solutions from the advent of the Renaissance onward. Attention is given to the interests of students majoring in history or literature. 3 units. (E) ASSOCIATE PROFESSOR HALL

240. ARCHITECTURE OF NORTH AMERICA.—A study illustrating the transplantation of European architectural customs since the sixteenth century; the

time-lag in transit and acceptance of later European developments; the gradual assumption of confident independence in design; and the emergence of international leaders in the United States. 3 units. (E) ASSOCIATE PROFESSOR HALL

292. RESEARCH PROBLEMS IN THE COLLECTIONS OF THE NORTH CAROLINA MUSEUM OF ART.—Students will meet once every week in the museum in Raleigh. Each student will submit a report on his particular research project. 3 units.* (F) VISITING PROFESSOR BIER

BIOCHEMISTRY AND NUTRITION

PROFESSOR HANDLER, CHAIRMAN—237 BELL BUILDING; ASSOCIATE PROFESSOR BYRNE, DIRECTOR OF GRADUATE STUDIES—218 BELL BUILDING; PROFESSOR TANFORD; ASSOCIATE PROFESSORS F. BERNHEIM, DAVIDSON, GUILD, HILL, KAMIN, LYNN, MCCARTY, THIERS, AND WAKIL; ASSISTANT PROFESSORS FRIDOVICH, GREENE, KIRSHNER, ROSETT, AND WHEAT

In the Department of Biochemistry graduate work is offered leading to the Ph.D. degree. A brochure may be requested from the department which describes the departmental facilities, the staff, the Ph.D. program, the special trainee stipends which are available to Ph.D. candidates in Biochemistry, and an M.D.-Ph.D. program.

Prerequisites are specified for each course, but interested students who cannot meet the requirements may be admitted by permission of the instructor.

FOR SENIORS AND GRADUATES

201. INTRODUCTORY BIOCHEMISTRY.—Three lectures and one conference per week. A rigorous introduction to fundamental aspects of biochemistry which emphasizes chemistry of biologically occurring macromolecules, mechanism of enzyme action, energy transformations, metabolic pathways, and biochemical genetics. 4 units. PROFESSOR HANDLER

203. CHEMISTRY OF NATURAL PRODUCTS.—This course will emphasize the organic chemistry of carbohydrates, lipids and steroids; aspects of stereochemistry, conformational analysis and physical methods of structural investigation will be discussed. Prerequisite: chemistry through organic; Biochemistry 201 or its equivalent is suggested. 2 units. (Not 1965-66) ASSOCIATE PROFESSOR DAVIDSON

206. LABORATORY METHODS IN BIOCHEMISTRY.—A laboratory course emphasizing the procedures and instruments of biochemical research. Each technique is employed in the course of a classical experiment demonstrating an important biochemical finding. Because the experimental materials are labile, one full day per week is spent in the laboratory. Prerequisite: Biochemistry 201 or equivalent. 2 units. ASSISTANT PROFESSOR ROSETT

FOR GRADUATES

301. ENERGY METABOLISM.—A lecture and seminar course on the metabolism of carbohydrates, lipids and biological oxidations; emphasizing energy production and utilization. Prerequisites: Biochemistry 201, 203 suggested. 3 units.
ASSOCIATE PROFESSOR WAKIL AND ASSISTANT PROFESSOR WHEAT

302. NITROGEN METABOLISM.—An intensive study, in lecture and seminar, of the metabolism of inorganic nitrogen compounds, proteins, and their component amino acids. Prerequisite: Biochemistry 201. 2 units.
ASSOCIATE PROFESSOR KAMIN AND ASSISTANT PROFESSORS KIRSHNER AND GREENE

304. PROTEINS AND ENZYMES.—The chemical and physical properties of proteins and enzymes. Thermodynamics, kinetics, and mechanisms of enzyme-catalyzed reaction. Prerequisites: Biochemistry 201 and physical chemistry equivalent to Chemistry 261-262. 4 units.
PROFESSOR TANFORD AND ASSOCIATE PROFESSORS HILL AND BYRNE

314. NUCLEIC ACIDS AND GENETIC MECHANISMS.—A lecture and seminar course on nucleic acids in biology with emphasis on the physical and chemical basis of their role as the structural units of heredity. Prerequisite: Biochemistry 201; 203 is suggested. 2 units. (Not 1965-66) ASSOCIATE PROFESSOR GUILD

345-346. SEMINAR.—Required of all graduate students majoring in biochemistry. I unit each semester. ASSISTANT PROFESSOR FRIDOVICH

348. SPECIAL TOPICS.—A lecture series on topics of current interest in biochemistry. 1 or 2 units. ASSOCIATE PROFESSOR MCCARTY

BOTANY

ASSOCIATE PROFESSOR JOHNSON, CHAIRMAN—141 BIOLOGICAL SCIENCES BUILDING; PROFESSOR BILLINGS, DIRECTOR OF GRADUATE STUDIES, 142 BIOLOGICAL SCIENCES BUILDING; PROFESSORS ANDERSON, HARRAR, KRAMER, NAYLOR, OOSTING, AND PERRY; ASSOCIATE PROFESSORS CULBERSON, HUMM, PHILPOTT, AND WILBUR; ASSISTANT PROFESSORS STONE AND WHITE

Graduate work in the Department of Botany is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate study in botany a student should have had in his undergraduate program at least 12 semester hours of botany beyond an elementary course, and related work in biological sciences. Some work in chemistry and physics will be desirable and, for some phases of botanical study, a necessity. Graduate Record Examination scores are required of all applicants. The student's graduate program is planned to provide a broad basic training in the various fields of botany, plus intensive specialization in the field of the research problem.

202. GENETICS.—The principles of heredity, their cytological basis, and their bearing on other fields of biology. Laboratory work involves experimental breeding of the fruit fly and interpretation of data from the breeding of plants. Offered in alternate years. Prerequisites: one year of botany, zoology, or equivalent, and one year of college mathematics. 4 units. PROFESSOR PERRY

203. PLANT CYTOLOGY.—A study of the structure and organization of plant cells in relation to growth, reproduction, and especially heredity. Prerequisite: one year of botany. (This is the same course as Zoology 243.) 4 units. PROFESSOR ANDERSON

205. ANATOMY.—Intensive survey of vascular plant cell types, tissues and organs, with emphasis on the modern application of anatomy to problems of systematics and phylogeny. Laboratories will include microtechnique. Special project and term paper stressing current techniques and literature required. Prerequisite: Permission of instructor. 4 units. ASSISTANT PROFESSOR WHITE

209. LICHENOLOGY. The morphology, systematics, and biological and ecological implications of the lichens. Collection and identification of specimens and the use of lichen chemistry in taxonomy. Prerequisite: Two semesters of botany. 3 units. ASSOCIATE PROFESSOR CULBERSON

210. BRYOLOGY. The morphological, systematic, and ecological characteristics of mosses and liverworts. 3 units. PROFESSOR ANDERSON

212. PHYCOLOGY. The morphological and ecological characteristics of the common freshwater and marine species and the principles underlying their classification. Collecting, identification, and the making of permanent microscopical preparations. 3 units. ASSOCIATE PROFESSOR HUMM

218. COMPARATIVE MORPHOLOGY OF VASCULAR PLANTS. Fundamental anatomical and morphological problems and theories in relation to vascular plant evolution, with emphasis on comparative vegetative and reproductive characters as indicators of evolutionary trends. Laboratory work stresses basic techniques in preparation of materials, analysis of results and correlation with data in current literature. Prerequisite: Botany 55 or permission of instructor. 4 units. ASSISTANT PROFESSOR WHITE

221. MYCOLOGY.—Field and laboratory study of the vegetative and reproductive structures of the fungi and slime molds. Methods of collection, isolation, propagation, and identification of the major orders as represented in the local flora. Prerequisite: one year of biological science. 4 units. ASSOCIATE PROFESSOR JOHNSON

225-226. SPECIAL PROBLEMS.—Students with adequate training may do special work in the following: (1) Mycology and Plant Pathology, (2) Cytology, (3) Ecology,

(4) Genetics, (5) Morphology and Anatomy of Higher Groups, (6) Morphology and Taxonomy of Lower Groups, (7) Physiology, (8) Taxonomy of Higher Groups, (9) Microbiology, (10) Experimental Taxonomy and Evolution. Credits to be arranged. ALL MEMBERS OF THE GRADUATE STAFF

240. PLANT EVOLUTION.—Microevolutionary change and factors influencing its rate and direction, with primary emphasis on examples from the plant world. 3 units. ASSISTANT PROFESSOR STONE

242. SYSTEMATICS.—A general survey of the principles of vascular plant taxonomy, with practice in identification and collection. Special project or term paper required. Lectures, laboratories, and field trips. Prerequisite: Permission of instructor. 4 units. ASSOCIATE PROFESSOR WILBUR

245. MORPHOLOGY.—Comparative survey of vegetative organization and reproductive cycles in the modern flora, with emphasis on evolutionary orgin and phylogeny. Special project and term paper required. Lectures, laboratories and field trips. Prerequisite: Permission of instructor. 4 units.
ASSOCIATE PROFESSOR CULBERSON

246. ECOLOGY.—Intensive study of the environmental effects on growth and distribution of plants at the level of the individual, the population, and the ecosystem. A term paper will be required. Lectures, laboratories and field trips. Prerequisite: Permission of instructor. 4 units. PROFESSOR BILLINGS

251. PHYSIOLOGY.—A general survey of the major physiological processes in plants, including food syntheses, growth and water relations. Special project and term paper required. Lectures, laboratories, and readings. Prerequisite: Permission of instructor. 4 units. PROFESSOR KRAMER

252. PLANT METABOLISM.—The physiochemical processes and conditions underlying the physiological processes of plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 units. PROFESSOR NAYLOR

254. PLANT WATER RELATIONS.—A study of factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Assigned readings, reports, and lectures. Prerequisite: Botany 151 or equivalent. 3 units. PROFESSOR KRAMER

255. PLANT SYSTEMATICS.—A study of the historical background of plant taxonomy, modern concepts and systems of classifications, nomenclatorial problems, and the taxonomy of specialized groups. Prerequisite: two years of botany, including Botany 52 or equivalent. 4 units. ASSOCIATE PROFESSOR WILBUR

256. COMMUNITY ANALYSIS AND CLASSIFICATION.—The development of concepts and methods in synecology and their present application to the study of plant communities. Prerequisite: Botany 156 or equivalent. 3 units.
PROFESSOR OOSTING

257. PRINCIPLES OF PLANT DISTRIBUTION.—Interpretation of floristic and ecological plant geography of world vegetation. Prerequisite: Botany 156 or equivalent. 3 units. PROFESSOR BILLINGS

258. PHYSIOLOGY OF GROWTH AND DEVELOPMENT.—Consideration of the internal factors and processes leading to the production of new protoplasm and its differentiation at the cellular, tissue, and organ level in plants. Prerequisites: Botany 151 or equivalent; organic chemistry recommended. 4 units.
PROFESSOR NAYLOR

259. THE ENVIRONMENT.—Environmental principles and methods of obtaining and evaluating climatological data for ecological purposes with special attention to instrumentation and microclimate. Prerequisite: Botany 156 or equivalent. 3 units. PROFESSOR BILLINGS

305. VEGETATION OF NORTH AMERICA.—Distribution and limits of the major plant communities, a study in ecological plant geography. Prerequisite: Botany 156 or equivalent. 3 units. PROFESSOR OOSTING

359-360. RESEARCH IN BOTANY.—Individual investigation in the various fields of botany. Credits to be arranged. ALL MEMBERS OF THE GRADUATE STAFF

CHEMISTRY

PROFESSOR SAYLOR, CHAIRMAN—115 CHEMISTRY BUILDING; PROFESSOR BRADSHER, DIRECTOR OF GRADUATE STUDIES—124 CHEMISTRY BUILDING; PROFESSORS BROWN, GROSS, HAUSER, HILL, HOBBS, KRIGBAUM, STROBEL, AND WILDER; ASSOCIATE PROFESSORS POIRIER, QUIN, AND SMITH; ASSISTANT PROFESSORS JEFFS, JONES, TOREN, AND WELLS; ADJUNCT PROFESSORS PETERLIN AND STANNETT

In the Department of Chemistry graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking a graduate program in chemistry, a student should have taken an undergraduate major in chemistry, along with related work in mathematics and physics.

Graduate courses in the department are designed to provide a broad basic training in the fields of inorganic, organic, analytical, and physical chemistry. An important requirement for the Ph.D. degree is the successful completion, under the direction of a member of the staff, of a research program leading to the solution of an original problem. The choice of the research problem, for either the A.M. or the Ph.D. degree, will determine the field of advanced specialization.

FOR SENIORS AND GRADUATES

206. ELEMENTS OF THEORETICAL CHEMISTRY.—A one-semester course in the general principles of physical chemistry. Credit is not given for both 206 and 161-162. Three recitations and three laboratory hours. Prerequisites: quantitative analysis, organic chemistry 8 units; physics 8 units, and introductory calculus. With the permission of the Director of Graduate Studies, graduate students from other departments may offer other advanced science courses in lieu of some of these prerequisites. 4 units. PROFESSOR SAYLOR

215. ADVANCED INORGANIC CHEMISTRY.—A study of modern theories of valence and molecular structure and inorganic compounds, particularly the less common types. Prerequisite: Physical Chemistry. 3 units. PROFESSOR HILL

216. NUCLEAR CHEMISTRY.—Elementary theory of nuclear reactions, properties of isotopes, and tracer techniques. Two lectures and three laboratory hours. Prerequisites: Introductory physics, analytical and organic chemistry. 3 units. PROFESSOR HILL

234. CHEMICAL INSTRUMENTATION.—Discussion of physico-chemical principles as applied to instrumental methods of analysis, illustrated by laboratory experiments with emphasis on methods involving electrical techniques. One lecture and three laboratory hours per week. Prerequisites: quantitative analysis and physical chemistry; the latter may be taken concurrently. 2 units. PROFESSOR STROBEL AND ASSISTANT PROFESSOR TOREN

251. QUALITATIVE ORGANIC ANALYSIS.—Systematic identification of organic compounds, including a study of solubilities and classification reactions. One lecture and three or six laboratory hours per week. Prerequisites: quantitative analysis and 8 units of organic chemistry. 2 or 3 units. ASSOCIATE PROFESSOR QUIN

252. ADVANCED ORGANIC PREPARATIONS.—A laboratory course designed to supplement the student's knowledge of fundamental organic processes by a selected group of laboratory exercises accompanied by oral discussions of techniques and theories pertinent to the experiments. Five hours laboratory and lecture, with lectures in alternate weeks. Prerequisites: quantitative analysis and 8 units of organic chemistry. 2 units. PROFESSOR BROWN

253. INTERMEDIATE ORGANIC CHEMISTRY.—An advanced study of the reactions of organic compounds and the theories of organic chemistry. Prerequisite: 8 units of organic chemistry. 3 units. ASSOCIATE PROFESSOR QUIN

271. INTRODUCTION TO RESEARCH.—Lectures on the use of chemical literature, research methods, recording and publication of results, and other topics. One lecture per week. 1 unit. PROFESSOR BROWN

275, 276. RESEARCH.—The aim of this course is to give instruction in methods

used in the investigation of original problems. Individual work and conferences. 1 to 6 units. ALL MEMBERS OF THE GRADUATE STAFF

FOR GRADUATES

303. THERMODYNAMICS.—Fundamental laws of thermodynamics and their application to chemistry. Prerequisites: Physical chemistry and one year of calculus. 3 units. PROFESSOR SAYLOR

304. PHYSICAL CHEMISTRY OF REACTIONS.—The theoretical aspects of reaction kinetics, chemical equilibrium, atomic and molecular forces, and the relation of these to chemical reactions are considered. Prerequisite: Physical chemistry. ASSOCIATE PROFESSOR SMITH

306. SPECIAL TOPICS IN PHYSICAL CHEMISTRY.—An introduction to the theory and to the application to physico-chemical problems of statistical thermodynamics, molecular spectroscopy, nuclear and electron magnetic resonance spectroscopy, intra- and inter-molecular interactions, and other selected topics.

Registration for other than chemistry graduate students by permission of the instructor. 3 units. PROFESSOR HOBBS

331, 332. SEMINAR IN ANALYTICAL AND INORGANIC CHEMISTRY.—Lectures, oral reports, and discussion on advanced topics and recent advances in the allied fields of analytical and inorganic chemistry. Prerequisites: Chemistry 215 and 234. 2 units. PROFESSORS HILL AND SAYLOR

342. ADVANCED ORGANIC CHEMISTRY.—Consideration is given to principles, theories and mechanism, as well as the usefulness in reactions, of organic reactions involving basic and acidic reagents. Prerequisite: Chemistry 253. 2 units. PROFESSOR HAUSER

350. ORGANIC REACTIONS.—A study of the scope and limitations of the more important types of reactions of organic chemistry from the point of view of their practical use in the synthesis of organic compounds. Prerequisite: Chemistry 253. 2 units. (Not 1965-66). PROFESSOR BRADSHER

352. MECHANISMS OF ORGANIC REACTIONS.—Mechanisms of various organic reactions are considered. Lecture or seminar one hour each week. Prerequisite: Chemistry 342. 1 unit. PROFESSOR HAUSER

353. SPECIAL TOPICS IN ORGANIC CHEMISTRY.—Various topics of interest to the organic chemist will be surveyed such as the chemistry of heterocyclic compounds, organometallic and organometalloid chemistry, terpenes, sesquiterpenes and steroids, small ring compounds, ring formation and transannular interactions. 2 units. ASSISTANT PROFESSOR JEFFS

354. STEREOCHEMISTRY.—A study of recent advances in stereochemistry of organic compounds including conformations and stereospecific reactions. The use of spectrophotometric methods for the determination of structure will be discussed. Prerequisites: Chemistry 251 and 341. 2 units. PROFESSOR WILDER

360. POLYMER CHEMISTRY.—A survey of the methods of preparation of high-molecular-weight organic compounds and a study of the properties characteristic of macromolecules in solution and in the solid state. Prerequisite: Chemistry 303. 2 units. PROFESSOR KRIGBAUM

361. ADVANCED POLYMER CHEMISTRY.—A number of topics in the chemistry and physics of high polymers will be discussed, including polymerization mechanisms and kinetics, crystallization and morphology of high polymers and solution properties. Prerequisite: Chemistry 360. 2 units. ADJUNCT PROFESSORS PETERLIN AND STANNETT

363, 364. SEMINAR IN PHYSICAL CHEMISTRY.—Various topics in Physical Chemistry which are of special interest to the staff or students are considered such as absorption and scattering of light, dielectric phenomena, electrode processes, electrolyte theory ion exchange, molecular structure and solubility. Seminar. Prerequisites: Physical chemistry and Chemistry 303. 2 units. PROFESSORS HILL, HOBBS, KRIGBAUM, SAYLOR, AND STROBEL; ASSOCIATE PROFESSORS SMITH AND POIRIER

365, 366. CHEMICAL PHYSICS, STATISTICAL THEORY.—General introduction to classical and quantum statistical mechanics and applications to chemical problems including: calculation of thermodynamic functions of gases, liquids and solids; solution theory; reaction velocity; and changes of state. 6 units. (365, Spring 1965-66; 366, Not 1965-66). ASSOCIATE PROFESSOR POIRIER

367, 368. CHEMICAL PHYSICS, QUANTUM THEORY.—General introduction of the quantum theory of atomic and molecular forces and the structure of matter. 6 units. (367, Not 1965-66; 368, Fall 1965-66). ASSISTANT PROFESSOR JONES

373, 374. SEMINAR.—Required of all graduate students in chemistry. One hour a week discussion. 2 units. ALL MEMBERS OF THE GRADUATE STAFF

CLASSICAL STUDIES

PROFESSORS ROGERS, TRUESDALE, ULLMAN, AND WILLIS

GREEK

FOR SENIORS AND GRADUATES

201-202. GREEK TRAGEDY. 6 units.* PROFESSOR TRUESDALE

257. SOCIAL AND CULTURAL HISTORY OF THE HELLENISTIC WORLD FROM ALEXANDER TO AUGUSTUS.—Lectures, reading, and discussions. This course will not be separately credited without the sequel, Latin 258. 3 units. PROFESSOR ROGERS

LATIN

FOR SENIORS AND GRADUATES

205-206. MEDIAEVAL LATIN.—Reading of selections from representative writers in prose and poetry. Practice in dealing with microfilms of mediaeval Latin texts. 6 units.* PROFESSOR ULLMAN

211-212. ROMAN ORATORY.—A survey of the history of Roman oratory, centering about the *Brutus* of Cicero and Tacitus' *Dialogus*. 6 units.* PROFESSOR ROGERS

258. SOCIAL AND CULTURAL HISTORY OF THE GRAECO-ROMAN WORLD.—The Roman Empire as the trustee of Hellenism and Christianity, and its own original contributions to modern civilization; lectures, readings, and discussions. This course continues Greek 257 and will not be separately credited. 3 units. PROFESSOR ROGERS

RELATED COURSES IN OTHER DEPARTMENTS

Philosophy 217; Religion 217, 313, 316, 318.

Under the terms of a co-operative agreement graduate students of Duke University may, with the approval of the chairman of their major department, take any graduate course offered by the Department of Greek and Latin of the University of North Carolina by the payment of a nominal fee. A list of these courses will be sent upon request.

Graduate students of Duke University may attend the American School of Classical Studies in Athens, Greece, without charge for tuition, and they are eligible to compete for the fellowships that are offered annually by the School. These consist of two fellowships in Greek archaeology, and one in the language, literature, and history of ancient Greece, each with a stipend of $2,000. They are awarded mainly on the basis of examination held in the beginning of February of each year. A somewhat similar connection exists with the American Academy in Rome.

COMPARATIVE LITERATURE

No graduate degree is offered in Comparative Literature. The following courses may serve in the minor programs of students in other departments. Professor Salinger is Chairman of the Department of Germanic Languages and Literature.

201, 202. ROMANTICISM.—Studies in the origin, rise and development of the Romantic Movement in the chief literatures of the Western World. The approach is comparative; the principal emphasis will be on England, France, and Germany with some reference to other countries. Selected subjects will occasionally be covered in lectures by speakers from various departments of the University. 6 units. (Not 1965-66). PROFESSOR SALINGER

203, 204. REALISM AND SYMBOLISM.—Comparative studies in the literatures of England, France, Germany, Russia, the Scandinavian countries, Spain and Italy, tracing the decline of romantic individualism and the reappraisal of man's significance against the social background. Selected subjects will occasionally be covered in lectures by speakers from various departments of the University. 6 units. (1965-66). PROFESSOR SALINGER

205. FOUNDATIONS OF TWENTIETH-CENTURY EUROPEAN LITERATURE.—The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Anouilh, Lagerkvist, Camus) evolving toward a mythology of man. 3 units. (Not 1965-66). PROFESSOR SALINGER

(See also Germanic Languages and Literature 206, Middle High German: The Arthurian Romance in Germany.)

ECONOMICS

PROFESSOR SMITH, CHAIRMAN—306 SOCIAL SCIENCE; PROFESSOR SPENGLER, ACTING DIRECTOR OF GRADUATE STUDIES—322 LIBRARY; PROFESSORS BLACK, DE VYVER, FERGUSON, HANNA, HOOVER, LANDON, MCGEE, AND VISITING PROFESSORS INGRAM AND KREPS; ASSOCIATE PROFESSORS BLACKBURN, DAVIES, GERHARD, GOODWIN, AND YOHE; ASSISTANT PROFESSORS DE ALESSI, NAYLOR, AND WALLACE

The Department of Economics offers graduate work leading to the A.M. and Ph.D. degrees. A student entering graduate work in economics should have completed with satisfactory grades at least 12 semester hours of undergraduate work in economics, including 6 hours of Principles of Economics. Among the undergraduate courses of distinct advantage to the graduate student in economics are General Accounting, Elementary Statistics, Intermediate Economic Theory, Money and Banking, International Trade, and basic courses in philosophy, psychology, mathematics, and social sciences other than economics.

Requirements for the Ph.D. in economics include a core of courses in Mathematical Economics, Statistical Methods, Micro- and Macro-economic Theory, Economic History, and the History of Economic Thought. Economic Growth and Demography, Money and Banking, International Trade, Economic Systems, Labor Economics, Public Finance, and Industrial Organization are optional fields, of which the student elects at least three in preparation for the preliminary doctoral examination. Course requirements for the Ph.D., including a minor field, may be completed in four semesters of residence.

FOR SENIORS AND GRADUATES

218. BUSINESS CYCLES.—The characteristics and measurement of cyclical fluctuations in output, employment, and prices; an historical survey of business cycle theories, modern macroeconomic theory and public policy as they relate to business cycles and associated problems of economic growth; techniques of forecasting cycles. 3 units.† ASSOCIATE PROFESSOR YOHE

233. STATE AND LOCAL FINANCE.—A study of expenditures, taxation, and financial administration in state and local governments with emphasis on current problems. Special attention will be given to research methods and materials and to the financial relations between state and local governments. 3 units.†
ASSOCIATE PROFESSOR DAVIES

237-238. STATISTICAL METHODS.—A study of statistical methods appropriate for dealing with problems in business and the social sciences. In addition to developing more thoroughly the subject considered in *Business Statistics*, the following methods will be considered: multiple, partial, and curvilinear correlation; curve fitting; probability; sampling distributions: and statistical inference. Pre-

requisite: Economics 138 or consent of the instructor. Either semester may be taken for credit. 6 units. PROFESSOR HANNA AND ASSISTANT PROFESSOR WALLACE

244. INTRODUCTION TO ECONOMETRICS.—A course in which the tools of economic theory, mathematics, statistical inference, electronic data processing are applied to the analysis of economic phenomena. The main objective is to give empirical content to economic theory. Matrix algebra is used to develop topics in statistical inference, classical linear regression, extensions of linear regression, and systems of simultaneous linear equations. Liberal use is made of the electronic computer as a means of estimating and testing the statistical significance of parameters of econometric relationships. 3 units.

262. TRADE UNIONISM AND COLLECTIVE BARGAINING.—An intensive survey of the trade union as an economic institution is followed by a study of the principles and problems of union-management relationship as found in collective bargaining. 3 units.† PROFESSOR DE VYVER

265. INTERNATIONAL TRADE AND FINANCE.—A study of the fundamental principles of international trade and foreign exchange. Subjects covered will include international specialization, balance of payments, foreign investments, tariffs and commercial policies, exchange control, exchange rates, and international monetary problems. 3 units.† ASSOCIATE PROFESSOR GERHARD

275-276. ADVANCED INDUSTRIAL ACCOUNTING AND MANAGEMENT.—A comprehensive examination of the rationale and techniques of control methods used in industry. Emphasis is laid on a critical evaluation of the practices followed by job-order, process, and standard costing, as well as the economics of overhead costs. Prerequisites: Economics 171-172 and permission of the Department. 6 units. PROFESSOR BLACK

301. ECONOMIC ANALYSIS.—Review of contemporary theory relating to consumer behavior, production, the firm, price formation, income distribution, and equilibrium. 3 units. ASSISTANT PROFESSOR DE ALESSI

304, 305. SEMINAR IN MONEY AND BANKING.—3 units each. ASSOCIATE PROFESSOR YOHE AND VISITING PROFESSOR KREPS

307. QUANTITATIVE ANALYSIS, I.—A systematic analysis of the principal quantitative methods used in microeconomic theory. Neo-classical theories of production and distribution are used as vehicles for presenting the material. Considerable emphasis is placed on the application of mathematical analysis to economic models. 3 units. PROFESSOR FERGUSON

308. QUANTITATIVE ANALYSIS, II.—Linear economic models, particularly Leontief models, are used in the exposition. Primary emphasis is placed on the application of mathematics to economic theory. Prerequisite: Economics 307 or consent of instructor. 3 units. PROFESSOR FERGUSON

311, 312. HISTORY OF POLITICAL ECONOMY.—A detailed review of the development of economic theory, the tools of economic analysis, and economics as a science, together with an analysis of the circumstances affecting this development. Period covered: pre-Christian times through 1936. 6 units. PROFESSOR SPENGLER

313-314. SEMINAR IN ECONOMIC THEORY.—The course consists of directed research in economic theory. The primary purpose is the correction of authoritative eclecticism and its replacement by individually integrated theory. Prerequisite: Economics 301 or its equivalent. 6 units. PROFESSORS HOOVER AND FERGUSON

315. SEMINAR IN ECONOMIC SYSTEMS.—3 units. PROFESSOR HOOVER

316. SEMINAR IN ECONOMIC FUNCTIONS OF THE STATE.—3 units. PROFESSOR HOOVER

317. SEMINAR IN DEMOGRAPHIC, POPULATION, AND RESOURCE PROBLEMS.—3 units. PROFESSOR SPENGLER

319. SEMINAR IN THE THEORY AND THE PROBLEMS OF ECONOMIC GROWTH AND CHANGE.—3 units. PROFESSOR SPENGLER

320. SEMINAR IN TRADE CYCLE, EMPLOYMENT, AND INCOME THEORY.—3 units. ASSOCIATE PROFESSORS YOHE AND BLACKBURN

329. FEDERAL FINANCE.—A study of the expenditures, revenues, and financial administration of the government of the United States, with emphasis on current problems. Special attention given to budgetary procedure, corporate and individual income taxes, and the financial relations between federal and state governments. 3 units. ASSOCIATE PROFESSOR DAVIES

330. SEMINAR IN PUBLIC FINANCE.—3 units. ASSOCIATE PROFESSOR DAVIES

331. SEMINAR IN ECONOMIC HISTORY.—3 units. PROFESSOR SMITH

340. NATIONAL INCOME.—A critical survey of the conceptual framework and structure of national income and its components, the reliability of national income estimates, and their use in analyzing questions of economic policy. 3 units. PROFESSOR HANNA

355. SEMINAR IN LABOR ECONOMICS.—3 units. PROFESSOR DE VYVER

358. SEMINAR IN LABOR MARKET AND RELATED ANALYSIS.—3 units. ASSOCIATE PROFESSOR GOODWIN

365. SEMINAR IN INTERNATIONAL TRADE.—3 units. VISITING PROFESSOR INGRAM

366. SEMINAR IN PROBLEMS IN INTERNATIONAL TRADE AND FINANCE.—The seminar will discuss selected topics of current interest, such as the European Common Market, international commodity agreements, migration of labor, amending the IMF charter, and the U.S. gold drain. Prerequisite: Economics 365 or equivalent. 3 units. ASSOCIATE PROFESSOR GERHARD

386. SEMINAR IN LATIN-AMERICAN ECONOMIC PROBLEMS.—3 units. PROFESSOR SMITH

388. INDUSTRIAL ORGANIZATION.—The theory, measurement and history of the firm-structure of industry. Emphasis upon the structure of American industry and upon actual production and pricing practices. Criteria for evaluating industrial performance. 3 units. PROFESSOR MCGEE

389. SEMINAR IN INDUSTRIAL AND GOVERNMENTAL PROBLEMS.—3 units. PROFESSOR MCGEE

401. SEMINAR ON THE BRITISH COMMONWEALTH.—3 units. PROFESSORS SPENGLER, COLE, AND HAMILTON

RELATED COURSES IN OTHER DEPARTMENTS

Courses comprising a candidate's minor may be selected from fields of forestry, history, mathematics, philosophy, physics, political science, psychology, and sociology and anthropology, or from an area that complements the candidate's area of research interests in economics.

EDUCATION

PROFESSOR CARTWRIGHT, CHAIRMAN—08D WEST DUKE BUILDING; PROFESSOR BOLMEIER, DIRECTOR OF GRADUATE STUDIES—08D WEST DUKE BUILDING; PROFESSORS BOWMAN, HOPKINS, HURLBURT AND STUMPF; ASSOCIATE PROFESSORS COLVER, GITHENS, GEHMAN, PETTY, RUDISILL, SHUMAN, SUBLETT, AND WEITZ; ASSISTANT PROFESSOR MARTIN

FOR SENIORS AND GRADUATES

Graduate work in Education is offered leading to the A.M., the M.Ed., the M.A.T., and Ed.D. degrees. For each of these degrees there are specific requirements and prerequisites, all of which may be found stated in detail in this *Bulletin*, pp. 30-41. Department requirements and prerequisites for all of these degrees may be obtained from the Director of Graduate Studies.

From the courses listed below, plus several in related disciplines, a selection may be made which will meet North Carolina requirements for the Advanced Principal's Certificate and the Superintendent's Certificate.

† Graduate students in Economics normally will not receive credit for courses so marked. These courses may be taken for credit by non-Economics graduate students, with the consent of the instructor.

(Some courses below are offered only in the Summer Session; see the Summer Session *Bulletin*.)

Accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's degree as the highest degree approved.

201. TEACHING AND SUPERVISION OF ARITHMETIC.—This course gives special attention to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. The course will consider the meaning theory, method of teaching, problem solving, evaluation, practice and drill, and selection and gradation of arithmetical contents. The course is designed for teachers and supervisors in the elementary school. 3 units.
ASSOCIATE PROFESSOR PETTY

203. PRINCIPLES OF SCHOOL ADMINISTRATION.—The fundamental facts and procedures of school administration, and analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. 3 units. PROFESSORS BOLMEIER, HURLBURT, AND STUMPF

204. THE SCHOOL AS AN INSTITUTION.—Consideration is given to the place of the school in the American social order, and its adaption to social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunity. 3 units. PROFESSOR BOLMEIER AND ASSISTANT PROFESSOR MARTIN

205. CURRICULUM PROBLEMS IN SECONDARY EDUCATION.—A consideration of the aims and objectives of secondary-school subjects, emphasizing practical problems of curriculum-making in the high school. 3 units.*
PROFESSOR CARTWRIGHT

210. INTRODUCTION TO EDUCATIONAL RESEARCH.—The general purpose of this course is to give the student an overview of research, acquaint him with the nature of research processes, and develop within him an appreciation of the essential characteristics of good research. 3 units. PROFESSOR STUMPF

211. THE PROBLEM CHILD (also listed as Psychology S211).—Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 3 units.

213. ELEMENTARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the elementary-school staff. The scope of elementary education is considered to encompass nursery school, kindergarten, and the elementary school. Special treatment is given to the problems of internal organization and management of the elementary school, and its integration with the secondary-school level. 3 units.* PROFESSOR STUMPF AND ASSOCIATE PROFESSOR SUBLETT

215. SECONDARY EDUCATION: PRINCIPLES.—Intensive study of principles, curriculum, and methods in secondary education. Accelerated course meeting six hours a week for half a semester. Must be accompanied by Education 216. 3 units.
PROFESSORS CARTWRIGHT, GITHENS, AND HURLBURT;
ASSOCIATE PROFESSORS SHUMAN AND SUBLETT

216. SECONDARY EDUCATION: INTERNSHIP.—Supervised internship in junior or senior high schools. Full-time observation and teaching for half a semester, accompanied by Education 215; or, with permission of the Department, full-time teaching for a semester, accompanied by Education 315. Students carrying Education 216 for credit toward a master's degree will be required to take six hours of senior or graduate work in addition to the normal degree requirements. 6 units. PROFESSORS CARTWRIGHT, GITHENS, AND HURLBURT;
ASSOCIATE PROFESSORS SHUMAN AND SUBLETT

217. THE PSYCHOLOGICAL PRINCIPLES OF EDUCATION.—An advanced

study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 3 units.

ASSOCIATE PROFESSORS GEHMAN AND WEITZ

222. THE CURRICULUM AND MATERIALS OF THE ELEMENTARY GRADES.—A study of curriculum problems in the elementary schools. 3 units.*

PROFESSOR HURLBURT AND ASSOCIATE PROFESSOR SUBLETT

224. TEACHING THE SOCIAL STUDIES IN ELEMENTARY SCHOOLS.—This course will treat objectives, curriculum trends, methods, and materials in elementary-school social studies. Topics to receive emphasis include unit-planning, use of the textbook, the reading program, using community resources, audio-visual materials, dealing with controversial issues, teaching time and place concepts, and evaluation. Opportunity will be provided for teachers to work on their own school problems in the social studies. 3 units. PROFESSOR CARTWRIGHT

225. THE TEACHING OF HISTORY AND THE SOCIAL STUDIES.—Evaluation of the objectives, content, materials, and methods in the teaching of history and the social studies. 3 units. PROFESSOR CARTWRIGHT

226. TEACHING READING IN THE ELEMENTARY SCHOOL.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. 3 units. ASSOCIATE PROFESSOR RUDISILL

228. IMPROVEMENT OF INSTRUCTION IN THE SOCIAL STUDIES.—An advanced treatment of curriculum, methods, and materials in the social studies. Individuals will concentrate on subjects and grade levels of their choice. 3 units.

PROFESSOR CARTWRIGHT

232. SUPERVISION OF INSTRUCTION.—A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to community needs. 3 units.* PROFESSOR HURLBURT

234. SECONDARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 3 units. PROFESSOR BOLMEIER

235. THE NATURE, FUNCTION, AND REORGANIZATION OF THE CURRICULUM.—Selected problems guiding the reading of students. 3 units.

PROFESSOR CARTWRIGHT AND ASSOCIATE PROFESSOR SUBLETT

236. TEACHING READING IN THE SECONDARY SCHOOL.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. The course provides practice with secondary-school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during a six-week period. For secondary-school teachers of all subjects who wish to improve the reading and study habits of their students. 3 units.

ASSOCIATE PROFESSOR RUDISILL

237. LITERATURE FOR ADOLESCENTS.—This course offers a critical survey of literature written for, or appropriate for junior and senior high school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 3 units. ASSOCIATE PROFESSOR SHUMAN

238. REMEDIAL READING—PRINCIPLES AND PRACTICE.—A study of the basic causes of reading disability and of principles, methods, and materials for the diagnosis and correction of specific difficulties. The course provides practice with grade school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during the six-week period. A basic course in the psychology of teaching of reading is prerequisite, or Education 226 may be taken concurrently. 3 units. ASSOCIATE PROFESSOR RUDISILL

239. METHODS AND PROBLEMS OF TEACHING ENGLISH IN SECOND-

ARY SCHOOLS.—This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar, and composition. Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles in the field. Several short compositions and a report will be required. 3 units.

PROFESSOR BOWMAN AND ASSOCIATE PROFESSOR SHUMAN

240. EDUCATIONAL AND OCCUPATIONAL INFORMATION.—A study of the sources of occupational and educational information: methods of securing and organizing occupational information; methods of providing vocational and educational information to students through career days, college conferences, class activities, and individual counseling; methods of making job analyses and community occupational surveys. 3 units.* ASSOCIATE PROFESSOR COLVER

241. PRINCIPLES OF GUIDANCE.—An historical survey of the philosophies of guidance; a study of the interrelationships between instruction, administration, and guidance in education. Prerequisite: 6 hours of psychology or educational psychology. 3 units. ASSOCIATE PROFESSOR COLVER

242. MEASUREMENT OF APTITUDES, INTEREST, AND ACHIEVEMENT.—A study of the theories and principles of psychological measurement as applied to aptitude, interest, and achievement testing (also listed as Psychology 242). Prerequisite: 12 hours of psychology or educational psychology (6 hours of which may be taken concurrently). 3 units.

243. PERSONALITY DYNAMICS.—A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 3 units.

ASSOCIATE PROFESSOR GEHMAN

244. COUNSELING TECHNIQUES.—A study of individual counseling techniques including diagnosis, interviewing, program planning, and counseling evaluation. Prerequisites: Education 242 and 243 or equivalent, which may be taken concurrently. 3 units. ASSOCIATE PROFESSOR GEHMAN

246. THE TEACHING OF MATHEMATICS.—This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. 3 units. ASSOCIATE PROFESSOR REYNOLDS

248. PRACTICUM IN COUNSELING.—Practice in individual counseling, including test administration, intake interviewing, diagnosis, counseling, program planning, report preparation, and evaluation. The student will be expected to devote about 150 hours to case work and conferences with his supervisor. Prerequisite: Education 244. 3 units. ASSOCIATE PROFESSOR WEITZ

249. INTRODUCTION TO EXCEPTIONAL CHILDREN.—Survey course in special education covering the educational, psychological, medical and social aspects of exceptional children. Field experiences including emotionally disturbed, mentally retarded, neurologically impaired, physically handicapped, crippling and special health conditions, socially and culturally deprived and gifted children. (Opportunities for attendance at psychiatric, psychological, and educational demonstrations with exceptional children.) 3 units. ASSISTANT PROFESSOR STEDMAN

250, 251. TEACHING EMOTIONALLY DISTURBED CHILDREN: INTERNSHIP.—Basic principles and practices in teaching and the organization of instructional materials. Work with children under the supervision of a certified teacher of emotionally disturbed children. Experience in general classroom teaching and small group and individualized instruction. Participation in staff conferences involving psychiatrists, psychologists, social case workers, and professional educators. 3 units each semester. ASSOCIATE PROFESSOR PETTY

252. THE SCHOOL IN THE LEGAL STRUCTURE.—Designed to show the legal relationships of the school to federal, state, and local governments. Considerable attention to legal rights, responsibilities, and liabilities of the teacher. Not open to those who have had Education 253. 3 units. PROFESSOR BOLMEIER

253. SCHOOL LAW.—The primary purpose of this course is to familiarize prospective school administrators and teachers with the legal features of school organi-

zation and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 3 units. PROFESSOR BOLMEIER

258. EDUCATIONAL MEASUREMENTS.—A critical study of the principles and techniques involved in measurement in education, with opportunity for individual research. Prerequisite: twelve semester hours in the Department, including a course in educational psychology. 3 units. ASSOCIATE PROFESSORS COLVER AND WEHZ

266. SCIENCE IN THE ELEMENTARY SCHOOL.—Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equipment, and field studies. 3 units.* PROFESSOR GITHENS

276. THE TEACHING OF HIGH-SCHOOL SCIENCE.—Discussion, lectures and collateral reading, related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for secondary-school science. 3 units. PROFESSOR GITHENS

285. AUDIO-VISUAL AIDS IN EDUCATION.—The aims and psychological bases of audio-visual materials in the classroom. Attention to such materials as charts, filmstrips, flat pictures, maps, models, motion pictures, radio, records, slides, and television. 3 units.*

290. ADMINSTRATION OF SCHOOL PROPERTY.—Planning and management of the school plant and its equipment to meet instructional, health, and community needs for immediate and long-range purposes. This course is intended for teachers, principals, and superintendents. Areas to be treated will include site selection; trends in design, lighting, ventilation, and heating; custodial service and maintenance; and financing. 3 units.* PROFESSOR STUMPF

291. PUBLIC AND COMMUNITY RELATIONS OF SCHOOLS.—A study of the relationships between the entire school or school system and the several publics, especially to the community of a given school. Media for interpreting needs and views of the school to the public and vice-versa will be explored. The study applies to both public and private schools. 3 units. PROFESSOR STUMPF

FOR GRADUATES

315. SEMINAR IN SECONDARY-SCHOOL TEACHING.—Advanced-level consideration of principles, practices, and problems in secondary-school instruction. Designed particularly to accompany an internship. For students without previous internship credit, this course must be accompanied by Education 216. 3 units. PROFESSOR HURLBURT

323. PUBLIC SCHOOL FINANCE.—A study of educational costs, sources of revenue for the support of public education, collection of revenue, basis of distribution, and accounting for funds spent. 3 units.* PROFESSOR STUMPF

333. SEMINAR IN HIGHER EDUCATION.—An examination of current problems in American higher education, with special emphasis on case studies in organization, administration, and evaluation. For graduate students interested in the administration of higher education or college teaching with consent of the instructor. 3 units. PROFESSOR HOPKINS

335-336. SEMINAR IN SCHOOL ADMINISTRATION.—Organization and control over public education. During the first semester special attention is given to "external control" such as is exercised by various branches and levels of government and by professional and lay groups. "Internal control" as this relates to the principal, the teaching staff, and methods of classroom control, is considered in the second semester. 6 units each semester.

PROFESSORS BOLMEIER, HURLBURT, AND STUMPF; ASSOCIATE PROFESSOR PETTY

350, 351. DIRECTED ACTIVITIES IN SCHOOL ADMINISTRATION.—This course will satisfy, in part, requirements for the Superintendent's or Advanced Principal's Certificate. It involves work on an administrative project approved and

supervised by the instructor. Open only to school administrators. 3 units each semester.

PROFESSORS BOLMEIER, HURLBURT, AND STUMPF; ASSOCIATE PROFESSOR PETTY

354. SEMINAR IN SCHOOL LAW.—Open to students who have completed Education 253 or its equivalent and are working or plan to work on doctoral dissertations or masters' theses of a legal nature. Reports on research projects and recent court cases. 3 units.* PROFESSOR BOLMEIER

ENGINEERING

JAMES LATHROP MERIAM, PH.D., DEAN; CHARLES ROWE VAIL, PH.D., ASSOCIATE DEAN FOR GRADUATE STUDY AND RESEARCH—136 ENGINEERING

The College of Engineering offers programs of study and research leading to the degrees of Master of Science with a major in civil, electrical, or mechanical engineering and Doctor of Philosophy with a major in civil or electrical engineering. These programs are designed to provide a fundamental understanding of the science of engineering, which is based on mathematics and the physical sciences, as well as a basic understanding of the art of engineering, which depends on human imagination and judgment.

A *minimum* of 30 units of earned graduate credit beyond the Bachelor's degree is required for the M.S. degree: 12 in engineering, 6 in related minor work (normally mathematics or natural science), 6 in either the major or minor subject or in other areas approved by the major department and the Dean of the College of Engineering, and 6 for a research-based thesis. There is no language requirement for this degree.

A *minimum* of 60 units of earned graduate credit beyond the Bachelor's degree is required for the Ph.D. degree: 24 in engineering, 12 in related minor work (normally mathematics or natural science), 12 in either the major or minor subject or other areas approved by the major department and the Dean of the College of Engineering, and 12 for a research-based dissertation. In addition, a reading knowledge of two foreign languages which are relevant to the field of the dissertation is required (normally two of the following: French, German, or Russian).

CIVIL ENGINEERING

PROFESSOR BROWN, CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES—121 ENGINEERING; PROFESSORS BRYAN, MERIAM, AND VESIC; VISITING ASSOCIATE PROFESSOR KUMAR; ASSISTANT PROFESSORS BARTON, HARRAWOOD, HILL, AND WOOD

A student may specialize in one of the following fields of study for either the M.S. or the Ph.D. degree with a major in Civil Engineering; engineering mechanics, hydraulic engineering, materials science, sanitary engineering, soil and foundation engineering, or structural engineering. Appropriate combinations of these fields are also encouraged. Each graduate student participates in seminars appropriate to his field of study.

Under the Reciprocal Agreement with the Consolidated University of North Carolina, a student may include as a portion of the minimum requirements work offered by the Department of Environmental Sciences and Engineering of the University of North Carolina. Although minor work normally is taken in the natural sciences or mathematics, a student whose major interest relates to the social sciences may take relevant minor work in this area.

A minimum prerequisite to the graduate program in civil engineering is a basic knowledge of mathematics through linear differential equations, materials science, solid mechanics, and fluid mechanics.

CE 201. ADVANCED MECHANICS OF MATERIALS.—Analysis of structural elements described by ordinary differential equations, such as beams on an elastic foundation, curved beams, beam-columns, circular plates; introduction to plates and shells; energy principles and their use in structural analysis. 3 units.

ASSISTANT PROFESSOR HILL

CE 202. EXPERIMENTAL STRESS ANALYSIS.—The experimental analysis of

stress and strain in deformable bodies, correlation of theory with data from experiments; photoelasticity; strain gauges; dimensional analysis and similitude principles of models. 3 units. ASSISTANT PROFESSOR HILL

CE 205. APPLIED ELASTICITY.—Introduction to linear theory of elasticity; solutions of two-dimensional problems; three-dimensional problems of torsion and bending; stress concentrations; energy and variational principles with applications to design. 3 units. PROFESSOR MERIAM AND ASSISTANT PROFESSOR HILL

CE 211. MECHANICAL BEHAVIOR OF MATERIALS.—Macroscopic mechanical properties of materials for static, fatigue, dynamic and creep conditions; impact, shock, and stress wave properties; temperature, creep, viscoelastic and relaxation properties. 3 units. VISITING ASSOCIATE PROFESSOR KUMAR

CE 212. STRUCTURAL MATERIALS.—Elasticity and plasticity as related to rheology; natural and synthetic materials; reinforced materials; composites. 3 units. VISITING ASSOCIATE PROFESSOR KUMAR

CE 221. INCOMPRESSIBLE FLUID FLOW.—Steady and unsteady pipe flow, theories of turbulent flow; water hammer theory and control; surge tanks; air chambers; the analysis and control of fluid systems; effect of resistance; tapered conductors. 3 units. ASSISTANT PROFESSORS HARRAWOOD AND WOOD

CE 231. STRUCTURAL ENGINEERING.—The application of the fundamental theories of structural action to the design and analysis of structural members; specifications. 3 units. PROFESSOR BROWN

CE 232. REINFORCED CONCRETE DESIGN.—Design and analysis of reinforced concrete members including the influence of shrinkage and plastic flow; bond and diagonal tension; prestressed concrete members. 3 units. PROFESSOR BROWN

CE 235. FOUNDATION ENGINEERING.—An introduction to methods of analysis, design and construction of foundations. Bearing capacity and settlement of shallow and deep foundations. Soil exploration; excavation and bracing; drainage and stabilization; underpinning. Foundation vibrations. 3 units.
PROFESSOR VESIC

CE 243, 244. SANITARY ENGINEERING UNIT OPERATIONS AND PROCESS DESIGN.—Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and bio-treatment processes. 6 units. PROFESSOR BRYAN

CE 250. ENGINEERING ANALYSIS.—General concepts of the solutions of engineering problems with special emphasis on digital and analog computer and numerical methods: deflection and stability; torsion of noncircular beams and multicelled thin-walled structures; vibrations of beams and membranes; structures with both uniform and nonuniform properties and with rigid and nonrigid supports. 3 units. ASSISTANT PROFESSOR WOOD

CE 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydraulic engineering; materials science; structural engineering; or sanitary engineering. Master's credit only. 6 units. MEMBERS OF THE GRADUATE STAFF

CE 302. THEORY OF PLATES AND SHELLS.—Analysis of stresses and deformation of plates; vibrations of plates; membrane stress systems in shells; cylindrical shell analysis; bending stresses in shells. Prerequisite: CE 201, or CE 205, or equivalent. 3 units. ASSISTANT PROFESSOR HILL

CE 321. MECHANICS OF IDEAL FLUIDS.—Basic equations of ideal fluid flow; potential and stream functions; vortex dynamics; body forces due to flow fluids; methods of singularities in two-dimensional flows; analytical determination of potential functions; conformal transformations; free-streamline flows. Prerequisite: Mathematics 285, 286 or equivalent. 3 units.
ASSISTANT PROFESSORS HARRAWOOD AND WOOD

CE 322. MECHANICS OF VISCOUS FLUIDS.—Equations of motion of a viscous fluid; general properties and selected solutions of the Navier-Stokes equations; boundary layer equations with selected approximate solutions; laminar

boundary layers in axisymmetric and three-dimensional flows; unsteady laminar boundary layers. Prerequisite: Mathematics 285, 286. 3 units.
ASSISTANT PROFESSORS HARRAWOOD AND WOOD

CE 331, 332. ADVANCED STRUCTURAL DESIGN AND ANALYSIS.—Analytical and behavior concepts of structural components as related to the design of structural systems; classical methods; numerical and approximate techniques; behavior of structural elements under static and dynamic loading; buckling behavior. Prerequisite: CE 231 or equivalent. 6 units. ASSISTANT PROFESSOR BARTON

CE 335. MECHANICAL BEHAVIOR OF SOILS.—Origin of soils, soil minerals and processes of soil formation; physical chemistry of multiphase systems and soil structure. Elements of soil stabilization; permeability and flow of water through soils: capillary and osmotic phenomena; seepage problems; soil compressibility; theory of consolidation; sheer strength and failure criteria. Stress-strain relationships, volume changes and pore pressures during shear, strength properties. Advanced laboratory soil testing techniques. 4 units. PROFESSOR VESIC

CE 336. ADVANCED SOIL MECHANICS.—Theories of plastic and elastic equilibrium of soil masses and their application to analysis of problems such as: pressure on retaining walls, anchored bulkheads, cofferdams, silos, shafts, tunnels; stability of slopes and earth dams; stresses and settlement in soil masses and pavements, piles and pile groups subjected to lateral loads, elements of soil dynamics. Prerequisite: CE 335. 4 units. PROFESSOR VESIC

CE 365. ADVANCED TOPICS IN CIVIL ENGINEERING.—Opportunity for study of advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 units.
MEMBERS OF THE GRADUATE STAFF

ELECTRICAL ENGINEERING

PROFESSOR WILSON, CHAIRMAN—128 ENGINEERING; PROFESSOR OWEN, DIRECTOR OF GRADUATE STUDIES—108A ENGINEERING; PROFESSORS MEIER AND VAIL; ASSOCIATE PROFESSOR ARTLEY; ADJUNCT ASSOCIATE PROFESSOR BURGER; ASSISTANT PROFESSORS GEORGE AND PILKINGTON; VISITING LECTURER WELLS

A student may specialize in any one of the following fields in working toward either the M.S. or the Ph.D. degree with a major in Electrical Engineering: solid-state materials and devices; ferromagnetics; superconducting circuits; instrumentation; electronics; microwaves; computers and automatic control; energy conversion; and information processing. Graduate level physics courses in the area of microwaves may be used to satisfy either major or minor course requirements in electrical engineering.

A minimum prerequisite to the graduate courses in electrical engineering is a basic knowledge of differential equations, electric and magnetic field theory, and the theory of networks. A previous course in modern physics is recommended.

EE 201. ENERGY SYSTEMS.—Application of general energy concepts to specific engineering devices and systems; use of mathematical models to describe concepts of energy storage, transfer, transformation, and control that are applicable to electromagnetic, mechanical, fluid, and thermal systems; the Lagrangian, Hamiltonian formulation, and tensors. Prerequisite: permission of instructor. 3 units.
ASSOCIATE PROFESSOR ARTLEY

EE 203, 204. INFORMATION SYSTEMS.—General concepts of information storage, transfer, and processing: information theory, coding, noise theory, and response of information-handling systems in the time and frequency domains. Applications of information concepts to specific engineering situations: modulation, sampling, optimum filtering, detection in presence of noise, and comparisons of various systems. Prerequisite: permission of instructor. 6 units.
PROFESSOR OWEN AND ASSISTANT PROFESSOR GEORGE

EE 207. NETWORK SYNTHESIS.—Linear network theory, including a review of time and frequency domain analysis; network graphs; network functions and

realizability conditions; driving point impedance synthesis of passive networks; driving point and transfer specifications; approximation methods. Prerequisite: permission of instructor. 3 units. PROFESSORS OWEN AND VAIL

EE 211. SOLID-STATE THEORY.—The fundamental theory of wave motion in solids, including wave mechanics; variational method; perturbation theory; many-electron problems; one-electron approximation; free-electron approximation; electron spin; Brillouin zones; time-dependent Schrodinger's equation; and transition probabilities. Introduction to the thermodynamics of solids, including Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; ensembles; entropy; and free-energy functions. Prerequisite: permission of instructor. 3 units.

PROFESSOR VAIL, ASSOCIATE PROFESSOR ARTLEY, ADJUNCT ASSOCIATE PROFESSOR BURGER, AND ASSISTANT PROFESSOR PILKINGTON

EE 212. SOLID-STATE MATERIALS.—Concepts of solid state physics as applied to engineering materials: electrical, magnetic, thermal, and mechanical properties of solids; dialectrics; ferroelectrics; semiconductors; magnetic materials; and superconductors. Prerequisite: EE 211. 3 units.

PROFESSOR VAIL, ASSOCIATE PROFESSOR ARTLEY, ADJUNCT ASSOCIATE PROFESSOR BURGER, AND ASSISTANT PROFESSOR PILKINGTON

EE 213. MAGNETICS.—A study of ferromagnetic and ferrimagnetic materials, including effects of thermal conditions and treatment, mechanical stress, magnetic field intensity, crystal structure, and macroscopic geometry. Study emphasizes relationships of fundamental concepts of engineering interest. Prerequisite: EE 211 or equivalent. 3 units.* PROFESSOR WILSON AND ASSOCIATE PROFESSOR ARTLEY

EE 222. NONLINEAR ANALYSIS.—Introduction to methods of analyzing engineering systems described by nonlinear differential equations; analytic, numerical, graphical, and series approximation methods; analysis of singular points; stability of nonlinear systems. Application of various methods, such as the modified Euler, Runge-Kutta, isoclines, perturbation, revision, variation of parameters, residuals, harmonic balance, Bendixon, and Liapounov to phenomena of nonlinear resonance, subharmonics, relaxation oscillations, and forced oscillating systems. Prerequisite: permission of instructor. 3 units. PROFESSOR WILSON

EE 231. NUCLEAR ENGINEERING.—Review of nuclear physics; fission and the chain reaction; nuclear reactor principles; materials, instrumentation, and control of nuclear reactors; selected applications and techniques of nuclear engineering. Prerequisite: permission of instructor. 3 units.* PROFESSOR MEIER

EE 241. FEEDBACK CONTROL SYSTEMS.—Analysis and design of linear sampled-data systems; linear systems subjected to random inputs; analytical design using mean square error and integral error criteria; nonstationary and nonlinear systems. Prerequisite: permission of instructor. 3 units.

PROFESSOR WILSON AND VISITING LECTURER WELLS

EE 259. ADVANCED ELECTRIC ENERGY CONVERSION.—Equations of motion of electromechanical systems; fields and lumped parameters; state function concepts; mathematical techniques for analyzing electromechanical devices and systems; transducers; unified treatment employing matrix, tensor, and block-diagram concepts to obtain response under static and dynamic conditions; the generalized rotating machine. Prerequisite: permission of instructors. 3 units.*

PROFESSORS MEIER AND WILSON

EE 265. ADVANCED TOPICS IN ELECTRICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within the electrical engineering department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 units.* MEMBERS OF THE GRADUATE STAFF

EE 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under direction of a member of the staff in one of the following fields: solid-state materials and devices, ferromagnetics, superconducting circuits, instrumentation, electronics, microwaves, computers and automatic control, and information processing. Master's thesis credit only. 6 units.

MEMBERS OF THE GRADUATE STAFF

EE 311. QUANTUM THEORY IN THE ENGINEERING OF MATERIALS.—Concepts of the quantum theory of solids as applied to the molecular design of engineering materials. Topics selected will vary somewhat with the interests of the class, but the importance of quantized fields in crystals (phonons, magnons, plasmons, excitons, and polarons) and the interaction of these fields will be stressed. Prerequisites: EE 212 and Physics 316. 3 units. ASSISTANT PROFESSOR PILKINGTON

EE 315, 316. SOLID-STATE DEVICES.—Study of terminal parameters and functional characteristics of electronic devices in terms of the properties and structural configurations of their constituent materials. First semester emphasis on such semiconductor devices as transistors and on integrated semiconductor circuits; second semester emphasis on other types of solid-state devices. Prerequisite: permission of instructor. 6 units.* ADJUNCT ASSOCIATE PROFESSOR BURGER AND ASSISTANT PROFESSOR PILKINGTON

EE 321. NONLINEAR ELECTROMAGNETICS.—Mathematical description of nonlinear magnetic and semiconductor characteristics; transient and steady-state analysis and synthesis of nonlinear systems with application to such topics as magnetic amplifiers, frequency converters, oscillators, computer logic, and switching devices. Prerequisite: permission of instructor. 3 units. PROFESSOR WILSON

EE 342. OPTIMUM CONTROL SYSTEMS.—Use of variational methods in control system design; classical calculus of variations; dynamic programming; Pontriagin's maximum principle; computer applications in control. Prerequisite: permission of instructor. 3 units.

EE 343. NONLINEAR CONTROL SYSTEMS.—Analysis and design of nonlinear feedback control systems; approximations for small and large disturbances; phase-plane analysis; describing-function techniques; relay servomechanisms, optimum and quasi-optimum performance; nonlinear compensation. Prerequisite: permission of instructor. 3 units. PROFESSOR WILSON AND VISITING LECTURER WELLS

MECHANICAL ENGINEERING

PROFESSOR KENYON, ACTING CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES—142A ENGINEERING; PROFESSORS MACDUFF AND MERIAM; ASSOCIATE PROFESSORS BOYLE, ELSEVIER, AND PEARSALL; ASSISTANT PROFESSORS BUZZARD AND HARMAN

Specialization in the following areas of study is available to students seeking the M.S. degree with a major in Mechanical Engineering: materials science; compressible and incompressible fluids; engineering mechanics; vibrations; heat transfer; and instrumentation. Emphasis is placed on the application of the fundamental concepts of basic science and engineering science to mechanical design and analysis.

A minimum prerequisite to the graduate courses in mechanical engineering is a basic knowledge of differential equations, undergraduate thermodynamic theory, mechanics, and machine design.

ME 201. THEORETICAL AND APPLIED MECHANICS.—Introduction to the theory of elasticity, vibration analysis, and hydrodynamics. 3 units. PROFESSORS MACDUFF AND MERIAM

ME 202. THEORETICAL THERMODYNAMICS.—Classical and modern concepts of the conversion of heat and work; the combined First and Second Law; thermo-electricity; super-critical pressure systems; reheat and regenerative processes; binary-vapor systems; introduction to unsteady systems. 3 units. ASSOCIATE PROFESSOR ELSEVIER AND ASSISTANT PROFESSOR HARMAN

ME 221. ANALYSIS OF INCOMPRESSIBLE AND COMPRESSIBLE FLUID FLOW.—Flow of incompressible and compressible fluids; analysis of subsonic, transonic, supersonic, and hypersonic flow of fluids; potential flow, turbulence, experimental methods. 3 units.* ASSISTANT PROFESSOR HARMAN

ME 222. ANALYSIS OF HEAT TRANSFER.—Heat transfer by conduction, convection, and radiation; lumped and distributed heat capacity, resistance, losses; steady and transient flow. 3 units.* PROFESSOR KENYON

ME 231-232. SYSTEMS ENGINEERING.—Methods of obtaining parameters for

strength, response, and stability studies of mechanical systems; impedance and operational means of analysis; mechanical and electronic analogs; nonlinear theories. 6 units. PROFESSOR MACDUFF

ME 265. ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisites: Approval of the Director of Graduate Studies and the instructor under whom work will be done. 1 to 3 units. MEMBERS OF THE GRADUATE STAFF

ME 280. NUCLEAR REACTOR POWER CYCLES.—Introduction to basic reactor principles and reactor types; consideration of thermodynamic cycles for nuclear reactors for stationary and mobile plants; analysis of fluid flow and heat transfer problems unique to reactors with development of methods of reactor safety techniques; metallurgical problems peculiar to reactor design. 3 units.*

PROFESSOR KENYON

ME 297, 298. THESIS RESEARCH.—A student with proper background may carry on research under the direction of the staff in one of the following fields: systems engineering, thermodynamics; heat transfer; and fluid flow. Thesis credit only. 6 units. MEMBERS OF THE GRADUATE STAFF

ENGLISH

PROFESSOR STEVENSON, CHAIRMAN—323 ALLEN BUILDING; PROFESSOR NYGARD, DIRECTOR OF GRADUATE STUDIES—321 ALLEN BUILDING; PROFESSORS BOYCE, DUFFEY, GOHDES, LIEVSAY, LUMIANSKY, SANDERS, TURNER, AND WARD; ASSOCIATE PROFESSORS BUDD, FERGUSON, HENINGER, SMITH, AND WILLIAMS

The department offers graduate work leading to the A.M., M.A.T., and Ph.D. degrees. A statement of the requirements for the Ph.D. degree may be obtained from the Director of Graduate Studies.

FOR SENIORS AND GRADUATES

203. CHAUCER.—Reading and interpretation of the minor poems, *Troilus*, and *The Canterbury Tales*. 3 units. PROFESSORS LUMIANSKY AND NYGARD

207. OLD ENGLISH GRAMMAR AND READINGS.—3 units.

PROFESSORS LUMIANSKY AND NYGARD

208. HISTORY OF THE ENGLISH LANGUAGE.—A survey of the language from Old to Present English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 3 units.

PROFESSORS LUMIANSKY AND NYGARD

209. PRESENT-DAY ENGLISH.—A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; semantic change; the relation of the written to the spoken language; usage. 3 units. PROFESSOR NYGARD

213. INTRODUCTION TO FOLKLORE.—A survey of the materials of popular tradition, the folksong, the folktale, the proverb, the riddle, and other forms; the methods of folklore investigation; and the relation of these popular genres to literary tradition. 3 units. (Not 1965-66) PROFESSOR NYGARD

215, 216. ELIZABETHAN DRAMA.—6 units. PROFESSOR LIEVSAY

217. MILTON.—Milton's poetry and prose, with emphasis on the major poems. 3 units. (Not 1965-66) PROFESSOR LIEVSAY

218. SPENSER.—A study of his works. 3 units. ASSOCIATE PROFESSOR HENINGER

219, 220. THE EIGHTEENTH CENTURY.—Swift, Pope, Defoe, Addison, Steele, and others are studied in the first semester; in the second, Gray, Johnson, Boswell, Collins, Goldsmith, the novelist, and other writers. 6 units.

PROFESSOR BOYCE, ASSOCIATE PROFESSOR FERGUSON

221, 222. ENGLISH LITERATURE OF THE EARLY NINETEENTH CEN-

TURY.—Wordsworth, Coleridge, Scott, Byron, Shelley, Keats, Lamb, Hazlitt, and other writers. 6 units. PROFESSORS SANDERS, STEVENSON

223, 224. ENGLISH LITERATURE OF THE LATER NINETEENTH CENTURY.—The first semester is devoted chiefly to Carlyle, Dickens, Thackeray, Tennyson and Browning; the second semester to Arnold, Ruskin, Pater, George Eliot, Meredith, the Pre-Raphaelites, and Swinburne. 6 units.
PROFESSORS SANDERS, STEVENSON

227. LITERARY CRITICISM.—A study of the Greek and Roman critics, in chronological order but with emphasis on their permanent value rather than on the mere history; also of the Continental and English critics to about 1700. 3 units. (Not 1965-66) PROFESSOR LIEVSAY

229, 230. AMERICAN LITERATURE, 1800-1865.—The writers emphasized in the first semester are Emerson, Thoreau, and Hawthorne; in the second semester, Poe and Melville. 6 units. PROFESSOR TURNER, ASSOCIATE PROFESSOR BUDD

233, 234. AMERICAN LITERATURE, 1865-1920.—Selected works of representative authors of the period. The first semester will include Whitman, Lanier, Mark Twain, James, Howells, Emily Dickinson, Henry Adams, and the Local Colorists; the second semester, Crane, Norris, Moody, London, Dreiser, Edith Wharton, Willa Cather, O'Neill, Robinson, and Frost. The lectures will deal primarily with literary trends as shaped by the social background. 6 units. PROFESSOR GOHDES

235, 236. AMERICAN LITERATURE SINCE 1920.—First semester, selected fiction from Sherwood Anderson to the present and the Imagist movement in poetry. Second semester, later poetry and consideration of recent drama. 6 units.
PROFESSOR DUFFEY

237. ENGLISH DRAMA, 1642-1800.—The heroic play and the comedy of manners of the Restoration; the important plays, serious and comic, of the eighteenth century. 3 units. PROFESSOR WARD

239. SHAKESPEARE.—The plays and poems. 3 units.
ASSOCIATE PROFESSOR WILLIAMS

244. LITERARY BIOGRAPHY.—Reading and discussion of works by Plutarch, Roper, Walton, Aubrey, Mason, Johnson, Boswell, Lockhart, Carlyle, Froude, Gosse, and Strachey: the development of the literary form, its various methods, various theories of its nature and purpose. 3 units. PROFESSOR SANDERS

251, 252. ENGLISH LITERATURE OF THE SEVENTEENTH CENTURY.—Major works in prose, poetry, and drama from 1600 to the death of Dryden. 6 units.
PROFESSOR WARD

261, 262. ENGLISH LITERATURE OF THE TWENTIETH CENTURY.—Representative work of leading writers from 1900 to 1950, in fiction, drama, and poetry. The first semester will include Shaw, Conrad, Yeats, Wells, Bennett, Galsworthy, Ford, Synge, Forster, and Lawrence; the second semester, Joyce, Woolf, Edith Sitwell, Eliot, Huxley, Graves, Bowen, Auden, and Dylan Thomas. Critical analysis of selected texts, with discussion of techniques and ideas. 6 units.
ASSOCIATE PROFESSOR SMITH

264. MAJOR DEVELOPMENTS IN CONTEMPORARY AMERICAN POETRY.—The principal contributions to modern poetry made by American poets, including imagism and the new poetry; Eliot, Stevens, Crane, the "Fugitives," and a selection from the poets of the present generation. 3 units.

266. RECENT CRITICAL THOUGHT.—Questions of the nature and value of literature as reflected in recent criticism, theoretical and practical. 3 units.
PROFESSOR DUFFEY

269, 270. SOUTHERN LITERATURE.—The principal authors and the chief literary development from the beginning to the present. Emphasis in the first semester is on Byrd, Kennedy, Simms, Poe, Timrod, and the humorists; in the second on Lanier, Harris, Cable, Mark Twain, Ellen Glasgow, and Faulkner. Attention is given to the historical and cultural background and to literary relations extending outside the region. 6 units. PROFESSORS TURNER

277. ENGLISH PROSE OF THE SIXTEENTH CENTURY.—Readings in the major forms and authors. 3 units. PROFESSOR LIEVSAY

278. ENGLISH NON-DRAMATIC POETRY OF THE SIXTEENTH CENTURY.—Extensive select readings from representative types and authors, excluding Spenser. 3 units. PROFESSOR LIEVSAY, ASSOCIATE PROFESSOR HENINGER

FOR GRADUATES

304. STUDIES IN THE METAPHYSICAL POETS.—A careful study of Donne, Herbert, and Vaughan against the seventeenth-century background, with some attention to their influence on other writers in the period and their impact on twentieth-century poetry. 3 units. PROFESSOR LIEVSAY

306. STUDIES IN CHAUCER.—Cultural background, sources, themes, structures; special attention to *Troilus* and the dream-vision poems. 3 units. PROFESSORS LUMIANSKY AND NYGARD

311. BEOWULF.—Reading and interpretation of the text. 3 units. PROFESSORS LUMIANSKY AND NYGARD

313. THE TRADITIONAL BALLAD AND FOLKSONG.—A survey of English, Scottish, and American popular poetry, with attention to the textual and musical traditions. (No technical knowledge of music is required.) 3 units. PROFESSOR NYGARD

315. MIDDLE ENGLISH LITERATURE.—The literature of England from 1100 to 1500 (excluding Chaucer); a study of medieval genres with a close reading of selected major works. 3 units. PROFESSORS LUMIANSKY AND NYGARD

320. MEDIEVAL ROMANCES.—Origins, types, forms, themes; special attention to Arthurian materials. 3 units. (Not 1965-66) PROFESSOR LUMIANSKY

322. GENRE STUDIES IN TWENTIETH-CENTURY AMERICAN LITERATURE.—Formal and thematic problems posed by the fiction, poetry or drama of this century. 3 units. PROFESSORS DUFFEY AND GOHDES

330. TEXTUAL CRITICISM.—The principles of analytical bibliography and their application to problems and procedures in the study of Elizabethan printed books. 3 units. ASSOCIATE PROFESSOR WILLIAMS

331. EMERSON.—A study of Emerson's ideas as reflected in selected examples of his essays and poems. 3 units. PROFESSOR GOHDES

332. WHITMAN.—A detailed study of *Leaves of Grass* and of selected prose works. 3 units. (Not 1965-66) PROFESSOR GOHDES

333. HAWTHORNE AND MELVILLE.—Extensive reading in the works of Hawthorne and Melville, and close study of selected writings. 3 units. PROFESSOR TURNER

334. STUDIES IN THE CRITICAL AND PHILOSOPHICAL IDEAS OF COLERIDGE AND CARLYLE.—3 units. PROFESSOR SANDERS

338. STUDIES IN AMERICAN REALISTIC FICTION.—Intensive study of a post-Civil War novelist such as Howells, with lesser attention to a representative precursor such as De Forest, and a twentieth century writer such as Dreiser. 3 units.

339. STUDIES IN SHAKESPEARE.—Intensive study of carefully limited topics, together with critical analysis and interpretation of selected texts. 3 units.

340. STUDIES IN RENAISSANCE ENGLISH PROSE.—Close readings in various forms and authors as they reflect the culture and thought of the Renaissance. 3 units. (Not 1965-66) PROFESSOR LIEVSAY

342. STUDIES IN DRYDEN AND HIS AGE.—The early poems, the important odes, the religious and political poems, selected critical and controversial prose, the heroic play and tragedy. 3 units. PROFESSOR WARD

345. THE EIGHTEENTH-CENTURY NOVEL.—Richardson, Fielding, Smollett, and Sterne are emphasized. Attention is given to earlier prose fiction and to other contributing literary patterns. 3 units. (Not 1965-66) PROFESSOR BOYCE

346. STUDIES IN SWIFT.—Intensive study of the major prose; selected readings in the verse, political writings, and miscellaneous prose. 3 units.
ASSOCIATE PROFESSOR FERGUSON

347. STUDIES IN VICTORIAN POETRY.—Analysis of themes, forms, and sources in the works of Tennyson, Browning, Arnold, Rossetti, Swinburne, Meredith, Hardy, and Hopkins. 3 units. PROFESSOR STEVENSON

348. STUDIES IN VICTORIAN FICTION.—Techniques and principal types of material in the novels of Dickens, Thackeray, Trollope, Eliot, Meredith, and Hardy. 3 units. PROFESSOR STEVENSON

363. STUDIES IN BRITISH POETRY OF THE TWENTIETH CENTURY.—Detailed examination of major poetic texts, with background readings in prose. 3 units. ASSOCIATE PROFESSOR SMITH

374. STUDIES IN AMERICAN HUMOR.—The native tradition in the Down-East humorists and the humorists of the Old Southwest, in Mark Twain and his contemporaries, and afterward. 3 units. PROFESSOR TURNER

378. SAMUEL JOHNSON'S LITERARY CRITICISM AND RELATED TOPICS. —3 units. PROFESSOR BOYCE

ENGLISH FOR FOREIGN STUDENTS.—A non-credit semester course in English for foreign students. Restricted to registered undergraduate and graduate foreign students and, to capacity, to employees and wives of foreign students. Without fee for registered students who are permitted an audit without fee; otherwise a $5.00 fee.

FORESTRY

PROFESSOR HARRAR, CHAIRMAN, 213 BIOLOGICAL SCIENCES BUILDING; PROFESSOR YOHO, DIRECTOR OF GRADUATE STUDIES, 104 BIOLOGICAL SCIENCES BUILDING; PROFESSORS ANDERSON, KRAMER, NAYLOR, OSBORNE, AND RALSTON; ASSOCIATE PROFESSORS JOHNSON AND WOODS; ASSISTANT PROFESSORS KNOERR, STAMBAUGH, AND SULLIVAN

Major and minor work is offered in the scientific aspects of forestry leading to the Master of Arts and Doctor of Philosophy degrees. Work for these degrees may be pursued in forest-tree physiology, wood anatomy and properties, forest pathology, silvics, forest soils, forest mensuration and biometry, forest entomology, forest economics, and forest climatology and hydrology. College graduates who have had specialized training in botany or soil science and in allied basic subjects, such as physics, chemistry, geology, and zoology, may pursue graduate study and research only in the specialized fields for which their previous work has qualified them. For information on professional training in forestry, see *Bulletin* of the School of Forestry. For detailed information concerning admission to the Graduate School and for regulations governing candidacy for the A.M. and Ph.D. degrees and for other regulations, consult the proper pages in this *Bulletin*.

FOR SENIORS AND GRADUATES

223. FOREST PATHOLOGY.—Infectious and non-infectious diseases of forest trees, and related deterioration of forest products. Field and laboratory study of symptoms, etiology, and control. Prerequisites: Botany 1 and 2, or equivalent. 3 units. ASSISTANT PROFESSOR STAMBAUGH

230. FOREST ENTOMOLOGY.—Morphology, general classification, life histories, and control of insects injurious to forest trees, logs, and lumber. 3 units.
PROFESSOR ANDERSON

243. SILVICS.—Ecological foundations of silviculture with special reference to forest site factors; influence of forests on their environment; growth and development of trees and stands; origin, development, and classification of forest communities; methods of studying forest environments. Desirable prerequisite: plant physiology, plant ecology, and Forestry 261, or equivalent. 3 units. (Summer only)
ASSOCIATE PROFESSOR WOODS

251. SAMPLING METHODS IN FORESTRY.—Statistical background for solution of sampling problems with special references to sampling of forest and associated populations. Prerequisite: Forestry 151. 3 units.* PROFESSOR OSBORNE

257. DESIGN OF FORESTRY EXPERIMENTS AND ANALYSIS OF DATA.—Role of experimental design in field and laboratory, and statistical analysis of data as aspects of scientific method in forest research. 5 units.* PROFESSOR OSBORNE

261. FOREST SOILS.—Origin, development, and classification of soils with special emphasis on those developed in humid climates; morphological, physical, and chemical properties of soils in relation to growth of trees; effect of forests on soils. Prerequisites: Chemistry 1 and 2, and Physics 1, or equivalents; physical geology, mineralogy, petrology, and analytical chemistry are also desirable. 3 units.

PROFESSOR RALSTON

270. ECONOMICS OF FORESTRY.—Development of the principles of economics useful in the analysis of the past, present, and prospective supply and demand situations for forestry goods and services; problems of the economics of the firm and industry, basic and peculiar to forestry, with special attention to the time dimensions of value; the role of forestry in the general economy including attention to relevant institutional factors. Prerequisite: at least one course in the principles of economics. 3 units. PROFESSOR YOHO

276. FORESTRY POLICY.—Objective study and analysis of the development of public land and forestry policies in the United States, present policies of public and private forestry organizations, and current policy issues in the light of economic and other criteria. 2 units. PROFESSOR YOHO

290. WOOD ANATOMY.—Study of the physical features and the gross and minute structural characteristics of wood leading to the identification of the commercial woods of the United States, and the important tropical woods used in American wood-working industries. Elementary microtechnique. Prerequisites: one year of biology, Forestry 241 or equivalent. 3 units.

ASSISTANT PROFESSOR SULLIVAN

295. SURFACE GENERATION IN WOOD.—Directed energy systems; physics of edges; details of wood surface generation machinery; surface generation in relation to wood anatomy; physical measurement of wood surfaces. Prerequisites: For. 290 or equivalent, calculus. 2 units. ASSISTANT PROFESSOR SULLIVAN

296. CHEMISTRY OF WOOD.—Nuclear, atomic and molecular force systems; chemical composition and distribution of chemical components in wood; interaction of wood and moisture; macro-chemical reactions of wood and other cellulosic systems including degradation reactions. Prerequisites: Forestry 290 or equivalent, calculus, organic chemistry. 3 units. ASSISTANT PROFESSOR SULLIVAN

297. WOOD PHYSICS (MECHANICS).—A study of the reaction of wood to mechanical forces; the derivation of working properties and their variance; experimental and standard testing procedures; introduction to theories of elasticity and plasticity; theories of failure; anatomical and moisture effects. Prerequisites: Forestry 290 or equivalent, calculus, college physics, statistics. 3 units.

ASSISTANT PROFESSOR SULLIVAN

FOR GRADUATES

301, 302. ADVANCED STUDIES IN FORESTRY.—To meet individual needs of graduate students in the following branches of forestry: (a) Silvics, (b) Forest Soils, (c) Forest Economics, (f) Properties of Wood, (g) Forest Mensuration and Biometry, (h) Forest Entomology, (k) Forest-tree Physiology, (l) Forest Pathology, (m) Forest Climatology and Hydrology.

ALL MEMBERS OF THE GRADUATE SCHOOL STAFF

321. RESEARCH TECHNIQUES IN FOREST PATHOLOGY.—Fundamental phytopathological methods employed in field and laboratory investigations of tree disease pathogens. Literature review and discussion of current developments. Prerequisite: Forestry 223 or equivalent. 3 units. ASSISTANT PROFESSOR STAMBAUGH

331. TOXICOLOGY OF INSECTICIDES.—Study of the physical, chemical, and biological properties of materials used to destroy insects. Formulation, toxicology

and insect physiology as related to insecticide action are emphasized. Prerequisites: one course in entomology; organic chemistry is recommended. 3 units.
PROFESSOR ANDERSON

332. ECOLOGY OF FOREST INSECTS.—Study of the environmental factors as they influence insect population development. Both the physical and the biotic aspects are considered on the basis of field and laboratory experimental methods. Prerequisite: Forestry 230 or equivalent. 3 units. PROFESSOR ANDERSON

333. MORPHOLOGY AND TAXONOMY OF FOREST INSECTS.—Principles of insect structure, classification and nomenclature; laboratory work concentrated on the collection, preservation and identification of both the adult and immature stages of various forest insects. Prerequisite: Forestry 230 or equivalent. 3 units.
PROFESSOR ANDERSON

341. FOREST METEOROLOGY.—The science of meteorology, including microclimatology, as it is related to forest biology and hydrology; emphasis is on physical laws governing exchange of heat and moisture in the climatic environment. Prerequisite: One year of college physics; calculus desirable. 3 units.
ASSISTANT PROFESSOR KNOERR

342. FOREST HYDROLOGY.—The influence of forests and other vegetation on local climate, the hydrolic cycle, and soil stability; relationships to water yield, floods, and erosion. Prerequisite: One year of college physics; calculus desirable. 3 units. ASSISTANT PROFESSOR KNOERR

344. MICROMETEOROLOGY.—Physics of the earth's surface environment with emphasis on plant and animal microclimates: budgets of mass, momentum and energy; vertical structure of wind, temperature, water vapor and carbon-dioxide in relation to exchange processes within the biosphere; local circulation and eddy diffusion; principles of micrometeorological measurement. Prerequisite: Forestry 341, calculus desirable. 3 units. ASSISTANT PROFESSOR KNOERR

347, 348. SEMINAR IN SILVICS.—Advanced topics in silvics are discussed and current research papers and reports are reviewed, analyzed, and evaluated. 2 units.
ASSOCIATE PROFESSOR WOODS

352. ANALYSIS OF FOREST MEASUREMENTS.—Empirical equations and curve-fitting appropriate to forestry data; functional relationships among experimental responses; useful mathematical models for forestry populations; selected non-parametric analysis methods. Prerequisite: Forestry 250 or Mathematics 233 or equivalents. 3 units. PROFESSOR OSBORNE

353. SAMPLING AND EXPERIMENTAL DESIGN IN FORESTRY.—Theory and application of selected sampling designs to forestry populations. Includes multistage and multi-phase designs; acceptance and sequential sampling; regression, ratio, and double sampling; sampling with variable probability of selection. Construction and analysis of designs for forestry experiments. Prerequisites: Forestry 250 or mathematics 233 or equivalents. 3 units. PROFESSOR OSBORNE

357, 358. RESEARCH IN FORESTRY.—Credits to be arranged. Students who have had adequate training may do research under direction of members of the faculty in the following branches of forestry.

a. SILVICS.—Prerequisites: Forestry 241, 243, and 244, or equivalents.
ASSOCIATE PROFESSOR WOODS

b. FOREST SOILS.—Prerequisite: Forestry 261 or equivalent.
PROFESSOR RALSTON

c. FOREST ECONOMICS.—Prerequisite: Forestry 270 or equivalent.
PROFESSOR YOHO

f. PROPERTIES OF WOOD.—Prerequisites: Forestry 259 and 260, or equivalents. PROFESSOR HARRAR AND ASSISTANT PROFESSOR SULLIVAN

g. FOREST MENSURATION AND BIOMETRY.—Prerequisites: Forestry 151, 251, and 252, or equivalents. PROFESSOR OSBORNE

h. FOREST ENTOMOLOGY.—Prerequisite: Forestry 230 or equivalent.
PROFESSOR ANDERSON

k. PHYSIOLOGY OF FOREST TREES.—Prerequisites: Plant physiology and plant ecology or silvics. PROFESSOR KRAMER

l. FOREST PATHOLOGY.—Prerequisites: Plant physiology and Forestry 223 or equivalent. ASSISTANT PROFESSOR STAMBAUGH

m. FOREST CLIMATOLOGY AND HYDROLOGY.—Prerequisite: Forestry 341, 342, or equivalents. ASSISTANT PROFESSOR KNOERR

362. FOREST SOIL PHYSICS.—Analysis of the physical properties of soil related to the growth and development of forest trees. Consideration is given to the significance of soil moisture, temperature, aeration, and structural characteristics in the analysis of forest growth relationships. Prerequisite: Forestry 261. 3 units. (Not 1964-65) PROFESSOR RALSTON

366. FOREST SOIL FERTILITY.—The relationships of soil fertility factors in the growth of forest trees. Emphasis is placed on the analysis of soil factors related to the mineral nutrition of trees. Prerequisites: Forestry 262 with analytical chemistry recommended. 3 units (1964-65) PROFESSOR RALSTON

368. FIELD SEMINARS.—Field studies, consultations, and visits to areas of interest during spring vacation period, or at other times, in the several branches of forestry listed under Forestry 301-302. Credits to be arranged. THE STAFF

378. SEMINAR IN FOREST ECONOMICS.—Examination and discussion of the application of economic concepts in forestry, the potential contribution of economic analysis to private and public forest management; current research in forest economics. Prerequisites: Forestry 270 and 379 or consent of the instructor; advanced courses in economics and economic theory are desirable. 2 units. PROFESSOR YOHO

379. ECONOMIC ANALYSIS IN FORESTRY.—Principles of economics of particular value to problems of resource allocation and efficiency in private forest management based on a static and dynamic firm theory approach, linear programming and activity analysis. Development of production principles applicable to forestry problems in use of land, labor, and capital; resource and production combinations; production location and timing; cost structure and asset control; uncertainty and expectations. Prerequisites: Forestry 270 or consent of instructor. 3 units. PROFESSOR YOHO

390. WOOD-LIQUID SURFACE INTERACTIONS.—Free surface energy of liquids and solids; theory of adhesion; adhesion for wood substrates; physical and chemical description of adhesives and adhesive joints; wood coatings; physical and chemical properties of surface coating materials. Prerequisites: Forestry 296. 3 units. ASSISTANT PROFESSOR SULLIVAN

391. SEMINAR IN WOOD SCIENCE AND FOREST PRODUCTS.—Application of scientific disciplines to product research and development; wood science in industry. 1 unit. PROFESSOR HARRAR, ASSISTANT PROFESSOR SULLIVAN

392. ADVANCED WOOD PHYSICS.—Theories of elasticity and plasticity; mechanical damping; piezoelectric properties; structure of crystals; fatigue failure. Prerequisites: Forestry 297, Forestry 296, Experimental Design. 3 units. ASSISTANT PROFESSOR SULLIVAN

GEOLOGY

PROFESSOR BERRY, CHAIRMAN, 019 SCIENCE BUILDING; ASSOCIATE PROFESSOR HERON, ACTING DIRECTOR OF GRADUATE STUDIES, 105 SCIENCE BUILDING; ASSISTANT PROFESSOR PILKEY

The Department of Geology offers graduate work leading to the A.M. degree. An undergraduate degree in geology is not a prerequisite for graduate studies, but a student must have had or must take introductory courses in mineralogy, sedimentary rocks, stratigraphy, paleontology, and structure. In addition he must have had one year of college chemistry, one year of college physics, and mathematics through calculus.

Graduate courses in the Department of Geology are designed to provide training in the field of environmental sedimentary geology with specialized training in bio-environments, litho-environments, or modern environments.

An acceptable thesis is required.

FOR SENIORS AND GRADUATES

203. ADVANCED STRATIGRAPHY.—A survey of the Phanerozoic deposits of the world with special emphasis on type areas. 3 units.

206. GEOLOGICAL OCEANOGRAPHY.—A broad survey of many geological aspects of the oceans including sediment types, processes of sedimentation, geological structures of the ocean basins, and bottom physiography. 3 units.
ASSISTANT PROFESSOR PILKEY

207. SEDIMENTARY PETROGRAPHY.—Systematic description and classification of sedimentary rocks. 3 units. ASSOCIATE PROFESSOR HERON

222. SEDIMENTARY MINERALS.—Major detrital and authigenic minerals with emphasis on the clay minerals. 3 units. ASSOCIATE PROFESSOR HERON

234. MARINE GEOLOGY.—Ocean-floor topography, sediment transport and deposition. 3 units. ASSISTANT PROFESSOR PILKEY

FOR GRADUATES

305. PHYSICAL ENVIRONMENTS SEMINAR.—3 units.
ASSISTANT PROFESSOR PILKEY

306. BIO-ENVIRONMENTS SEMINAR.—3 units.

371, 372. ADVANCED TOPICS IN GEOLOGY.—To meet the individual needs of graduate students for independent study in the various environmental sedimentary fields. 1 to 3 units. ALL MEMBERS OF THE GRADUATE STAFF

RELATED COURSES IN OTHER DEPARTMENTS

Courses comprising a candidate's minor may be selected from the fields of zoology, physics, mathematics, chemistry, or approved courses offered in the Department of Geology at the University of North Carolina at Chapel Hill.

GERMANIC LANGUAGES AND LITERATURE

PROFESSOR SALINGER, CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES—106 OLD LAW; VISITING PROFESSOR JACKSON; ASSOCIATE PROFESSORS PHELPS, SEYMOUR AND WILLSON; ASSISTANT PROFESSOR DEINERT

The Department of Germanic Languages and Literature offers graduate work leading to the A.M. degree. Students who expect to major in German should have had sufficient undergraduate courses in Germanic languages to enable them to proceed to more advanced work.

Students who wish to take courses in German for a minor should normally have completed a third-year course (in exceptional cases, a second-year) of college German with acceptable grades.

201, 202. GOETHE.—A study of his life and works, in the light of his lasting significance to world literature. 6 units. (Not 1965-66) PROFESSOR SALINGER

203, 204. EIGHTEENTH CENTURY.—Eighteenth-century German literature in its relation to contemporary European philosophy. 6 units.*
ASSOCIATE PROFESSOR PHELPS

205 MIDDLE HIGH GERMAN.—The language and literature of Germany's first classical period. 3 units.* ASSOCIATE PROFESSOR SEYMOUR

206. MIDDLE HIGH GERMAN.—The Arthurian Romance in Germany. 3 units.
PROFESSOR JACKSON

207, 208. GERMAN ROMANTICISM.—The course covers the entire field of German Romanticism from 1800 to 1850. 6 units. (1965-66)
ASSOCIATE PROFESSOR WILLSON

209, 210. KLEIST, GRILLPARZER, AND HEBBEL.—The development of the drama in Germany and Austria between Schiller and naturalism. 6 units.*
PROFESSOR SALINGER AND ASSOCIATE PROFESSOR WILLSON

211, 212. HEINRICH HEINE.—A study of the German poet and his immediate successors in the movement known as *Jungdeutschland*. 6 units. (1965-66)
PROFESSOR SALINGER

213. NINETEENTH-CENTURY LITERATURE.—From the end of Romanticism through Realism. Readings from Mörike, Büchner, Hebbel, Stifter, Keller, Meyer, Storm, and Fontane. 3 units. (Not 1965-66) ASSISTANT PROFESSOR DEINERT

214. THE TWENTIETH CENTURY.—From Naturalism to the present, with emphasis on Hauptmann, Hofmannstal, George, Rilke, Mann, Kafka, Hesse, Broch, Musil, Brecht, and Benn. 3 units. (Not 1965-66) ASSISTANT PROFESSOR DEINERT

215 SEVENTEENTH-CENTURY LITERATURE.—A study of the leading writers of the Baroque, seen against the background of their time. 3 units. (1965-66) ASSISTANT PROFESSOR DEINERT

216. HISTORY OF THE GERMAN LANGUAGE.—The development of the phonology, morphology, and syntax of German from earliest beginnings to the present. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR SEYMOUR

218. THE TEACHING OF GERMAN.—Critical survey of modern teaching techniques; intensive practice in solving problems encountered in the teaching of German on the secondary and college levels. Analysis and evaluation of textbooks and related audio-visual materials with special emphasis on the utilization of the language laboratory. 3 units.* (1965-66) ASSOCIATE PROFESSOR PHELPS

—.GRADUATE READING COURSE. An intensive course in German to develop rapidly the ability to read German in several fields. Graduate students only. No credit. ASSOCIATE PROFESSOR SEYMOUR

RELATED COURSES IN OTHER DEPARTMENTS

The following courses in other departments are recommended to students who are majoring in Germanics, as particularly valuable in building a proper background for Germanic studies:

(a) Graduate courses in literature or philology, offered by the ancient and modern language departments, to be selected after consultation with the Germanic Department.

(b) Graduate courses in history and philosophy, offered by those departments, to be selected after consultation with the Germanic Department.

HISTORY

PROFESSOR WATSON, CHAIRMAN—235 ALLEN; PROFESSOR PARKER, DIRECTOR OF GRADUATE STUDIES—232 ALLEN; PROFESSORS ALDEN, COLTON, CRANE, CURTISS, FERGUSON, HAMILTON, HOLLEY, LANNING, MANCHESTER, ROGERS, ROPP, AND WOODY; ASSOCIATE PROFESSORS ACOMB, DAVIS, DURDEN, HOLLYDAY, SCOTT, VAN AKEN, AND YOUNG; ASSISTANT PROFESSORS GILLIN AND LERNER

A candidate for the degree of Doctor of Philosophy is required to prepare himself for examination in five fields, of which four shall normally be within history and of which one must be in American history or in the history of Western Europe. The choice and delimitation of fields is determined in consultation with his supervisor and the Director of Graduate Studies. The Department offers graduate instruction in Ancient History; Medieval Europe; Modern Europe; American History; England and the Commonwealth; Russia; Latin America; the Far East in the modern period; South Asia in the modern period; military history; and historiography.

Students may receive credit for either semester of a hyphenated course without taking the other semester if they obtain written permission from the instructor and the Director of Graduate Studies.

FOR SENIORS AND GRADUATES

201-202. THE HISTORY OF RUSSIA, 1801-1917.—The development of the Russian Empire in its political, social, and economic aspects, and the growth of forces leading to its downfall. 6 units. PROFESSOR CURTISS

203-204. THE UNITED STATES, 1850-1900.—The rise of sectionalism, secession, wartime problems of the Union and Confederacy, political and economic adjust-

ments of Reconstruction, the status of the Negro, the New South, problems of capital and labor, the agrarian revolt, political parties and reform. 6 units. (Not 1965-66) PROFESSOR WOODY

205-206. THE UNITED STATES IN THE TWENTIETH CENTURY.—The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administration. 6 units. PROFESSOR WATSON

209-210. CONSTITUTIONAL HISTORY OF THE UNITED STATES, 1760 TO THE PRESENT.—A study of the basic problems in forming the Constitution; of its development through the major crises in the history of the United States; of the effects of changing social, cultural, economic, and political conditions on the Constitution. 6 units. (Not 1965-66)

212. RECENT INTERPRETATIONS OF UNITED STATES HISTORY.—A course designed to encourage a critical evaluation of major issues in United States history through examination of recent interpretations of key problems. 3 units. PROFESSOR WATSON

213-214. THE OLD SOUTH.—Political thought and party trends from Jefferson to Calhoun; agriculture, slavery, expansion; commerce, manufacturing, transportation; urban life, religion, education; the rise of Southern nationalism. 6 units. PROFESSOR WOODY

215-216. THE DIPLOMATIC HISTORY OF THE UNITED STATES.—A study of the history of American diplomacy, with particular emphasis upon those factors, foreign and domestic, which have shaped the foreign policies of the Republic. 6 units. ASSOCIATE PROFESSOR DAVIS

217, 218. EUROPE SINCE 1870.—International relations since the Franco-German War is the chief subject of study in this course; special emphasis is placed upon the underlying economic and political influences. 6 units.

221-222. THE AGE OF THE RENAISSANCE.—The decline of characteristic features of medieval civilization and the rise of modern European institutions with particular attention to intellectual movements from Dante to Erasmus. 6 units.

223-224. THE OLD REGIME AND THE FRENCH REVOLUTION, 1661-1815. —A study of social, political, and intellectual revolutions in continental Europe, centering on France and giving special attention to successive interpretations of historical change. 6 units. ASSOCIATE PROFESSOR ACOMB

225. THE AGE OF THE REFORMATION.—History and thought of Christianity between 1517 and 1680. (Also listed as Religion 250.) 3 units. ASSOCIATE PROFESSOR HILLERBRAND

227, 228. EUROPE IN THE NINETEENTH CENTURY.—A study, beginning with the career of Napoleon Bonaparte, of the forces and personalities influential in the nineteenth century. Emphasis in the first semester is on the problems of the biographer; in the second, on those of a student of national communities. 6 units. (Not 1965-66) PROFESSOR PARKER

229. RECENT INTERPRETATIONS OF MODERN EUROPEAN HISTORY.—A course designed to develop the ability to appraise critical historical issues through the study and discussion of recent interpretations of key historical problems in modern European history. 3 units. PROFESSOR PARKER

231-232. THE HISPANIC COLONIES AND REPUBLICS IN AMERICA.—6 units. PROFESSOR LANNING

233-234. THE INSTITUTIONAL, CULTURAL, AND SOCIAL HISTORY OF HISPANIC AMERICA.—The first semester deals with the culture, society, and institutions of the Spanish colonies in America, and the second semester with those of the Hispanic American Republics. 6 units. (Not 1965-66) PROFESSOR LANNING

235, 236.—EUROPEAN EXPANSION OVERSEAS.—In the first semester attention is given to the age of discovery, and to the origin and the development of the great

European overseas empires with special emphasis on the role of the Portuguese in India and the Americas. The work of the second semester deals with the decline of the mercantile empires, the emergence of independent centers of European culture overseas (Brazil being taken as an example), and the revival of mercantile imperialism in the late nineteenth and twentieth centuries. 6 units.

PROFESSOR MANCHESTER

237-238. EUROPE IN THE MIDDLE AGES, 395-1500.—Attention is given both to distinctive attributes of the period, such as feudalism and scholastic learning, and to such formative elements of European civilization as nationalism and the universities. 6 units. ASSOCIATE PROFESSOR YOUNG

241-242. NATIONALISM AND COMMUNISM IN THE FAR EAST.—The growth of nationalism in China and Japan, culminating in Japan's invasion of China and the subsequent rise to power of the Chinese Communists. 6 units.

ASSISTANT PROFESSOR GILLIN

245-246. WAR IN THE MODERN WORLD.—This course is concerned with the relations between warfare and modern political, economic and social conditions. Special attention is given to the development of British and American military methods and to the events of the American Civil War and the two World Wars. The work in the first semester deals with Clausewitz's theories of warfare and the period from the introduction of gunpowder to 1871; in the second semester there is a more detailed analysis of recent land, sea, and air warfare. 6 units.

PROFESSOR ROPP

247. THE HISTORY OF MODERN INDIA, 1757-1857.—Historiography of the period; the western impact on the sub-continent; the expansion of Company power; the background and nature of the Indian Mutiny; problems in historical analysis and interpretation. 3 units. PROFESSOR CRANE

248. THE HISTORY OF MODERN INDIA AND PAKISTAN, 1857-1947.—Historiography of the period; Crown rule; social change; modernization and the economy of the sub-continent; development of nationalism; the Gandhian era and Muslim separatism; the transfer of power and partition; problems of independence. 3 units. PROFESSOR CRANE

249-250. SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES.—Evolution of American society and thought to the present; lectures and class discussions seek to illuminate the interplay of ideas and social practice by the examination of attitudes and institutions in such fields as science and technology, law, learning, and religion. 6 units. PROFESSOR HOLLEY

251-252. RECENT EUROPEAN HISTORY.—A history of the political and economic developments in Europe since 1870. 6 units. PROFESSOR COLTON

257. SOCIAL AND CULTURAL HISTORY OF THE HELLENISTIC WORLD FROM ALEXANDER TO AUGUSTUS.—Lectures, readings, and discussions. This course will not be separately credited without the sequel, 258. 3 units.

PROFESSOR ROGERS

258. SOCIAL AND CULTURAL HISTORY OF THE GRAECO-ROMAN WORLD.—The Roman Empire as the trustee of Hellenism and Christianity, and its own original contributions to modern civilization; lectures, readings, and discussions. This course continues 257 and will not be separately credited. 3 units.

PROFESSOR ROGERS

259-260. THE EMERGENCE OF THE NEW SOUTH, 1865 TO THE PRESENT.—Reconstruction, industrialization, and agrarian revolt; changing status of the Negro; the South's role in the reform movements headed by Theodore Roosevelt, Woodrow Wilson, and Franklin D. Roosevelt. 6 units.

ASSOCIATE PROFESSOR DURDEN

261-262. RUSSIA IN THE TWENTIETH CENTURY.—A study of the background of the Revolution of 1917 followed by an analysis of the history and policies of the Soviet state. 6 units. ASSISTANT PROFESSOR LERNER

263-264. AMERICAN COLONIAL HISTORY AND THE REVOLUTION, 1607-

1789.—The founding and institutional development of the English colonies: the background, progress, and results of the Revolution. 6 units. PROFESSOR ALDEN

265-266. MODERN SOUTH AMERICA.—Political, social, and economic history of leading South American nations from the mid-nineteenth century to the present. 6 units. ASSOCIATE PROFESSOR VAN AKEN

267, 268. FROM MEDIEVAL TO EARLY MODERN ENGLAND.—The intellectual, social, and political problems of transition to modern England, with special emphasis on the English Renaissance. 6 units. PROFESSOR FERGUSON

269. BRITISH HISTORY FROM 1714 TO 1867.—The interrelationship of the leadership of such men as Walpole, Chatham, Pitt, and Peel with war, revolution, and social institutions; the rise of the cabinet system; the Industrial Revolution; imperial changes; and reform. 3 units. PROFESSOR HAMILTON

270. GREAT BRITAIN AND THE COMMONWEALTH OF NATIONS, 1867 TO THE PRESENT.—A history of Great Britain at the height of her world dominance and beyond, her oceanic empire, and the evolution of that empire into a unique world-wide Commonwealth of Nations. 3 units. PROFESSOR HAMILTON

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the main sources and traditions of the classical civilization of the Indian subcontinent with particular attention to religious movements and institutions. (Also listed as Religion 285.) 3 units. ASSISTANT PROFESSOR SULLIVAN

297. THE BRITISH EMPIRE IN THE NINETEENTH CENTURY (From 1783).—3 units.

298. THE COMMONWEALTH IN THE TWENTIETH CENTURY.—3 units.

FOR GRADUATES

303-304. THE UNITED STATES IN THE TWENTIETH CENTURY.—The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administration. 6 units. PROFESSOR WATSON

305-306. SEMINAR IN ENGLISH AND COMMONWEALTH HISTORY.—The work consists of practical training in the methods of historical research based on sources for modern British history. 6 units. PROFESSORS FERGUSON AND HAMILTON

307-308. SEMINAR IN UNITED STATES HISTORY.—6 units.
PROFESSORS HOLLEY AND WATSON, AND ASSOCIATE PROFESSOR DURDEN

309-310. SEMINAR IN AMERICAN COLONIAL AND REVOLUTIONARY HISTORY.—6 units. PROFESSOR ALDEN

315-316. SEMINAR IN SOUTHERN HISTORY.—Year course. 6 units.
PROFESSOR WOODY

317-318. SEMINAR IN THE HISTORY OF WESTERN EUROPE.—6 units.
PROFESSORS COLTON AND PARKER, AND ASSOCIATE PROFESSOR SCOTT

321-322. SEMINAR IN THE HISTORY OF SPAIN, HISPANIC AMERICA, AND INTER-AMERICAN RELATIONS.—6 units. PROFESSOR LANNING

343-344. SEMINAR IN THE HISTORY OF AMERICAN FOREIGN RELATIONS.—6 units.

347-348. SEMINAR IN RECENT INDIA.—6 units. PROFESSOR CRANE

361-362. SEMINAR IN THE HISTORY OF RUSSIA.—6 units.
PROFESSOR CURTISS

401. SEMINAR IN THE BRITISH COMMONWEALTH.—3 units.
PROFESSORS COLE, HAMILTON, AND SPENGLER

410. SEMINAR IN THE GOVERNMENT, HISTORY, AND SOCIAL STRUCTURE OF INDIA AND PAKISTAN.—3 units.
PROFESSOR BRAIBANTI, VISITING PROFESSOR ISLAM, ASSOCIATE PROFESSOR SINHA

HISTORIOGRAPHY AND THE TEACHING OF HISTORY

FOR GRADUATES

312. SEMINAR IN THE TEACHING OF HISTORY IN COLLEGE.—The work in this course is intended to acquaint students with the problems involved in teaching history in college. It includes critical observation of the teaching by members of the History staff in Duke University. Year course. 2 units.

PROFESSOR MANCHESTER

This course is required of all candidates for the degree of Doctor of Philosophy who are in residence as many as two years at Duke University.

320. HISTORIOGRAPHY.—A critical study of the process of finding, appraising, and interpreting the sources of history and of the presentation of the results in narrative. Works of important historians from Herodotus to the present are analyzed. The student undertakes specific exercises in research, criticism, and narration. There is consideration of such general topics as schools, theories, philosophies, and the function of history. Year course. 4 units.

This course is required of all candidates for the degree of Doctor of Philosophy who are in residence as many as two years at Duke University.

HOSPITAL ADMINISTRATION

PROFESSOR BROWN, PROGRAM DIRECTOR—234-B BAKER HOUSE; PROFESSOR FRENZEL; ASSOCIATE PROFESSOR SWANSON; ASSISTANT PROFESSOR SMITH, COORDINATOR OF GRADUATE STUDIES—234-B BAKER HOUSE

Graduate study leading toward preparation for a career of administration in hospitals and other health agencies is offered through a 24-month program leading to the M.H.A. Degree. The program in Hospital Administration is composed of 36 graduate units, of which 18 are in Hospital Administration and 18 are in designated courses in Economics, Political Science, and Sociology. Included in the program is a 12-month administrative residency, a period of supervised administrative experience conducted under faculty supervision in hospitals and other health agencies located within commuting distance of the University campus. Admission to this program is limited to 12 students per year; selection is based on suitability for management of health agencies as well as on capability for graduate study. As there are requirements for participation in the program in Hospital Administration in addition to basic admission requirements of the Graduate School, interested individuals should obtain complete information on prerequisites and selection procedures from the Coordinator of Graduate Studies.

201. HISTORY AND DEVELOPMENT OF HOSPITALS AND OTHER HEALTH AGENCIES.—This course is designed to give the student a broad concept of the health field. It includes a study of the evolution of health institutions, analysis of medical care organizations in the United States, and an introduction to the medical sciences and to medical terminology. 3 units.

ASSISTANT PROFESSOR SMITH

203-204. PRINCIPLES OF ORGANIZATION AND MANAGEMENT OF HOSPITALS AND OTHER HEALTH AGENCIES.—A study of the hospital as an institution including its administrative structure, relationship of the medical staff, and the organization and function of each department. Emphasis is placed on the financial, legal, staffing, community relationship, and other managerial considerations of hospital administration. 6 units.

PROFESSORS BROWN AND FRENZEL, ASSOCIATE PROFESSOR SWANSON, ASSISTANT PROFESSOR SMITH

211-212. SEMINARS IN HEALTH ADMINISTRATION.—A series of seminars designed to complement and add depth to the material covered during the first year, to analyze further the operation of hospitals and other health agencies, and to make the experiences of the residency meaningful.

Attention will be given to formalized techniques of problem-solving, decision-making, human relations, communications, and relating day-to-day experiences to the management process.

Special emphasis will be placed on social and economic aspects of health care and on identifying and projecting current trends in the health field. 6 units.
STAFF AND PRECEPTORS

215. ADMINISTRATIVE RESIDENCY (1 calendar year).—Designed to give the student broader and deeper knowledge and understanding of hospitals and other health agencies through practical experience. Varied experience is provided by rotation through a university medical center, a community hospital, a Veterans Administration and special hospitals, a public health department, a prepayment plan, and other governmental and voluntary health agencies. Two months of the residency will be spent in field experience with the Hospital Section of The Duke Endowment. 3 units. STAFF AND PRECEPTORS

MATHEMATICS

PROFESSOR GERGEN, CHAIRMAN—134 PHYSICS BUILDING; PROFESSOR ROBERTS, DIRECTOR OF GRADUATE STUDIES—227 PHYSICS BUILDING; PROFESSORS CARLITZ, DRESSEL, ELLIOTT, MURRAY, AND THOMAS; ASSOCIATE PROFESSORS GALLIE, REYNOLDS, SHOENFIELD, AND WARNER; ASSISTANT PROFESSORS BRYSON, BURDICK, HARRIS, HINRICHS, KELINGOS, PATRICK, SCOVILLE, SMITH, AND STACKELBERG

Graduate work in the Department of Mathematics is offered leading to the A.M. and Ph.D. degrees. The student, in his undergraduate work, must have had courses in differential and integral calculus, and at least 6 semester hours of other courses in mathematics on the junior or senior level.

The A.M. degree with a major in mathematics is awarded primarily on the basis of scholarship. Of the 24 units of course work required for this degree, 18 units must be taken in the Department of Mathematics.

The Ph.D. degree in mathematics is awarded upon the demonstration of ability and training in research. The original dissertation, therefore, is the most important of the formal requirements for the degree.

Since a reading knowledge of French, German, and Russian is highly desirable for the student of mathematics, he should satisfy the language requirements in two of these languages as early as possible.

213-214. MODERN ALGEBRA.—Construction of the number system. Introduction to groups, fields, rings, vector spaces, linear transformations, matrices. 6 units. (1965-66, Retired Officers Program only) PROFESSOR ROBERTS

215-216. INTERMEDIATE ANALYSIS.—Elements of the theory of functions, principally for real variables. Sequences and series, continuity, differentiation, integration. 6 units. (1965-66, Retired Officers Program only) PROFESSOR GERGEN

217-218. ANALYSIS.—Introduction to set theory, construction of real and complex numbers beginning with the Peano postulates, elementary topology of real and complex numbers, properties of continuous functions, derivatives, mean value theorem, Riemann integral, fundamental theorem of integral calculus. Prerequisite: Mathematics 64 for 217; and 217 for 218. 6 units. STAFF

221. DIGITAL COMPUTER.—History of computers; number representation, information storage, logical arithmetic; components and organization of computing systems; coding and programming; compilers; error analysis. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. The fee is payable to the Treasurer's Office of Duke University at the beginning of the semester. 3 units. ASSISTANT PROFESSOR PATRICK

222. INTRODUCTION TO NUMERICAL ANALYSIS.—Error analysis; real and complex roots of equations; finite difference methods and theory of interpolation; numerical differentiation and integration; numerical integration of ordinary and partial differential equations; simultaneous equations and matrix inversion. Prerequisite: Mathematics 221. 3 units. ASSOCIATE PROFESSOR GALLIE

225. THEORY OF EQUATIONS.—Permutations, determinants, matrices, linear systems, polynomials and their roots, constructibility, resultants, discriminants, simultaneous equations. 3 units. (Not 1965-66) STAFF

227-228. THEORY OF NUMBERS.—Congruences, arithmetic functions, compound moduli, quadratic reciprocity, Gauss sums, quadratic forms, sums of squares. Prerequisite: calculus. (Not 1965-66) PROFESSOR CARLITZ

229-230. ALGEBRAIC NUMBERS.—Ideals, unique factorization, divisors of the discriminant, determination of the class number. Prerequisite: theory of equations. 6 units. (Not 1965-66) PROFESSOR CARLITZ

233. STATISTICAL METHODS.—Parameter estimation and hypotheses testing from samples, linear regression, correlation, analysis of variance and covariance, components of variance, multiple regression. 3 units. ASSISTANT PROFESSOR BRYSON

234. SAMPLE DESIGNS.—Methods of constructing and analyzing survey designs; elements of simple random sampling, stratified sampling, multi-stage sampling; methods of estimation; questionnaire construction; refusals and not-at-homes. Prerequisite: Mathematics 233. 3 units. ASSISTANT PROFESSOR BRYSON

235-236. ABSTRACT ALGEBRA.—Groups, fields, rings, matrices, quadratic and bilinear forms, general Galois theory, hypercomplex systems. Prerequisite: calculus. 6 units. PROFESSOR THOMAS

244. DESIGN OF EXPERIMENTS.—Methods of constructing and analyzing designs for experimental investigations, Latin square, split-plot, simple and partially confounded factorial designs, incomplete block designs, treatment of missing data, techniques of experimentation. Prerequisite: Mathematics 233. 3 units. ASSISTANT PROFESSOR BURDICK

245-246. COMBINATION ANALYSIS.—Generating functions, permutations, distributions, partitions, compositions, trees, and networks. Prerequisite: calculus. 6 units. (Not 1965-66) PROFESSOR CARLITZ

247-248. ARITHMETIC OF POLYNOMIALS.—Field theory, detailed study of finite fields, special polynomials and functions, valuation theory, the zeta function. Prerequisite: Mathematics 236 or consent of the instructor. 6 units. (Not 1965-66) PROFESSOR CARLITZ

253-254. DIFFERENTIAL GEOMETRY.—Curves and surfaces in three-dimensional Euclidean space, applicability, differential parameters, Riemannian geometry of n-space. Prerequisite: calculus. 6 units. (Not 1965-66) PROFESSOR THOMAS

271-272. INTRODUCTORY TOPOLOGY.—Topological properties of Euclidean spaces, set-theoretic and combinatorial methods. Prerequisite: calculus. 6 units. ASSISTANT PROFESSOR HINRICHS

283. PROBABILITY FOR ENGINEERS.—Basic probability concepts, the sample space, discrete and continuous events, permutations and combinations, conditional and marginal probability, discrete and continuous distributions, expected values and moments, sampling distributions, estimation, hypothesis testing, confidence intervals, multiple regression, one-way analysis of variance. Prerequisite: calculus. 3 units. ASSISTANT PROFESSOR BURDICK

285. APPLIED MATHEMATICAL METHODS I.—Vectors, line and surface integrals, tensors, complex variables, differential and integral equations. Prerequisite: Mathematics 64. 3 units. PROFESSOR DRESSEL

286. APPLIED MATHEMATICAL METHODS II.—Wave equation, Fourier series, heat equations, telegraphic equation, Legendre polynomials, Bessel functions, Schrödinger's equation. Prerequisite: Mathematics 64. 3 units. PROFESSOR DRESSEL

287-288. FOUNDATIONS OF MATHEMATICS.—Propositional calculus, predicate calculus, axiomatized number theory. Gödel completeness and incompleteness theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 63, or consent of the instructor. 6 units. (1965-66) ASSOCIATE PROFESSOR SHOENFIELD

291-292. THEORY OF FUNCTIONS.—Limits, implicit functions, power series, double series, Cauchy's theorem and its applications, residues, Riemann surfaces, conformal mapping. Prerequisite: calculus. 6 units. ASSISTANT PROFESSOR STACKELBERG

FOR GRADUATES

325-326. REAL VARIABLE.—Number system, Lebesgue and Stieltjes integrals, topics in Fourier series. Prerequisite: Mathematics 291-292. 6 units.
ASSISTANT PROFESSOR SCOVILLE

327-328. PARTIAL DIFFERENTIAL EQUATIONS.—Boundary and initial value problems, regularity and existence theorems by methods of *a priori* estimates and functional analysis. Representations of solutions, spectral theory, and potential theory. Prerequisite: Mathematics 291-292 or consent of the instructor. 6 units. (1965-66) ASSISTANT PROFESSOR HARRIS

331-332. ADVANCED TOPICS IN COMPLEX VARIABLES.—Entire and meromorphic functions; harmonic functions and potential theory; Riemann surfaces; several complex variables. 6 units. (Not 1965-66) ASSISTANT PROFESSOR HARRIS

333-334. ANALYTIC THEORY OF NUMBERS.—Distribution of primes, primes in an arithmetic progression, Waring and Goldbach problems, applications of elliptic functions. Prerequisite: Mathematics 291-292. 6 units. (Not 1965-66)
PROFESSOR CARLITZ

337-338. EXISTENCE THEOREMS.—Systems of partial differential equations, Pfaffian systems, theorems of Cauchy, Riquier, and Cartan, singular integral varieties. Prerequisite: Mathematics 291-292. 6 units. (1965-66) PROFESSOR THOMAS

343-344. ORDINARY DIFFERENTIAL EQUATIONS.—Solution by separation of variables, exact differentials, integrating factors, solution in series. Cauchy's existence theorem, linear differential systems, singular points, partial differential equations equivalent to ordinary systems. Prerequisite: Mathematics 291-292. 6 units. (Not 1965-66) PROFESSOR THOMAS

371-372. DIMENSIONAL THEORY.—Abstract spaces, separation theory for Euclidean spaces, dimension theory. Prerequisite: Mathematics 271-272. 6 units. (1965-66) PROFESSOR ROBERTS

383-384. LIE GROUPS AND ALGEBRAS.—Differential manifolds; Lie groups; one-parameter subgroups; Lie algebras; differential forms; classification and representations of compact Lie groups and semisimple Lie algebras; solvable and nilpotent algebras; Ado's theorem. Prerequisites: Mathematics 236 and either Mathematics 272 or 292. (Not 1965-66) ASSOCIATE PROFESSOR SHOENFIELD

395-396. TOPOLOGICAL ALGEBRA.—Normed and locally convex spaces, Banach algebras. Prerequisites: Mathematics 236 and 292, or consent of instructor. 6 units. (1965-66) ASSOCIATE PROFESSOR WARNER

MICROBIOLOGY AND IMMUNOLOGY

PROFESSOR CONANT, CHAIRMAN—321 BELL BUILDING; ASSOCIATE PROFESSOR GROSS, DIRECTOR OF GRADUATE STUDIES, 350 BELL BUILDING; PROFESSORS AMOS, BEARD, LARSH, RUNDLES, SMITH, AND WILLETT; ASSOCIATE PROFESSOR DAY; ASSISTANT PROFESSORS BURNS, METZGAR, OSTERHOUT, ZMIJEWSKI

The Department of Microbiology and Immunology offers courses of study leading to A.M. and Ph.D. degrees. A description of the departmental facilities, staff, and Ph.D. and Masters programs can be obtained by writing to the Director of Graduate Studies. Special trainee stipends are available to a limited number of deserving applicants each year.

M211. HEMATOLOGY.—Three lectures and three laboratory periods of 3 hours each, weekly, for eleven weeks in the spring quarter. Prerequisites: courses in general zoology, general botany, histology, and comparative anatomy. 4 units.
PROFESSOR RUNDLES

M221. BACTERIOLOGY AND IMMUNOLOGY.—This course is devoted primarily to the study of the biological and immunological relationships of microorganisms (bacteria, fungi, Rickettsia, and viruses) in disease. Five lectures, two 1-hour conferences, and three laboratory periods of 3 hours each weekly, in fall

quarter. Prerequisites: courses in general zoology, general botany, histology and comparative anatomy, general and organic chemistry. 6 units.

PROFESSORS AMOS, CONANT, D. T. SMITH, WILLETT; ASSOCIATE PROFESSORS DAY, GROSS; ASSISTANT PROFESSORS BURNS, METZGAR, OSTERHOUT, ZMIJEWSKI

M291. MEDICAL PARASITOLOGY.—One lecture and one three-hour laboratory period per week for eleven weeks during the fall quarter. Prerequisites: courses in Zoology 204, general botany, histology and comparative anatomy. 1 unit.

PROFESSORS CONANT AND LARSH; INSTRUCTOR EIRING

231. FUNDAMENTALS OF IMMUNOLOGY.—A lecture course on general immunology including the following: non-specific factors in immunity, nature of antigens and antibodies, antibody production, complement, serological methods, blood groups, autoimmune diseases, tumor, immunity, transplantation immunity, and hypersensitivity. 2 units. (Spring Semester)

PROFESSOR AMOS; ASSOCIATE PROFESSOR DAY; ASSISTANT PROFESSORS METZGAR AND ZMIJEWSKI

302. MICROBIAL GENETICS.—A seminar and lecture course in microbial genetics with special emphasis on gene structure and functions. Admission by permission of instructor. 2 units. (Spring, alternate years) ASSOCIATE PROFESSOR GROSS

303. ANIMAL VIRUSES AND ANIMAL VIRUS DISEASES.—A seminar course to explore various aspects of virus morphology, growth characteristics, immunology and the pathogenesis of virus diseases. Admission with the approval of the staff. (Spring) 2 units. ASSISTANT PROFESSOR OSTERHOUT

310. MICROBIAL PHYSIOLOGY.—A lecture course devoted to an analysis of the structure and composition of microbes as related to function and growth. Attention will be given to microbial metabolism with emphasis on mechanisms controlling the production and utilization of metabolites. Two lectures per week. Prerequisite: Biochemistry 201 or equivalent. (Spring, alternate years; not given 1965). ASSISTANT PROFESSOR BURNS

311. ADVANCED IMMUNOLOGY.—Genetic control of antigen production, development of antigens in embryogenesis, destruction of antigens in tissue, relationship to differentiation, aggregation. Theories of antibody formation. Nature of antibodies; combining site; antibodies of similar specificity but different properties, reactivity of antibody fractions. Mechanisms of tolerance and immunological paralysis, split and partial tolerance, immunological enhancement. Cellular immunity and the reactions of circulating and cytrophilic antibody. Homograft rejections and auto immunity and delayed hypersensitivity. 2 units.

PROFESSOR AMOS; ASSOCIATE PROFESSOR DAY; ASSISTANT PROFESSORS METZGAR AND ZMIJEWSKI

312. CANCER IMMUNOLOGY.—An intensive and critical analysis of progress in a major branch of immunological research covering cancer antigens, the tumor-homograft reaction, and the immunotherapy of cancer. Prerequisite: consent of the instructor. 2 units. ASSOCIATE PROFESSOR DAY

313. IMMUNOHEMATOLOGY.—A lecture and laboratory demonstration course covering the serological, genetic, and anthropological aspects of human blood groups isoantigens and antibodies. 2 units. ASSISTANT PROFESSOR ZMIJEWSKI

314. IMMUNOCHEMISTRY.—The structure of antibody molecules. The nature of the combining site. The hapten as a molecular probe. Forces involved in antigen—antibody interaction. Specificity, avidity, and cross-reaction of antibodies. Purification of antibodies. Antibodies as analytical reagents. Prerequisites: Fundamentals of Immunology or Biochemistry or Physical Chemistry or consent of instructor. 2 units. ASSOCIATE PROFESSOR DAY

315. METHODS IN IMMUNOLOGY.—This is essentially a laboratory course in which the student will become familiar with the following methods of immunology: agar precipitation, immunoelectrophoresis, direct agglutination, indirect agglutination, immunofluorescence, complement-fixation and passive cutaneous anaphylaxis. 3 units. ASSISTANT PROFESSORS METZGAR AND ZMIJEWSKI

316. ANTIGENIC FACTORS IN GRAFT REJECTION.—Production of inbred

and co-isogenic strains. Mutation and recombination in inbred animals and tumors. Genetic control of histocompatibility iso-antigens in tumors and normal tissues, differential gene action in hybrids and tumors. Antigenic and immunogic factors in homograft rejection, tests for genetic compatibility. Modification of the immune response by genetic or immunologic procedures—tolerance, enhancement, suppression of antigens. 2 units. PROFESSOR AMOS

323. READINGS IN BACTERIOLOGY AND IMMUNOLOGY.—This course is intended primarily for graduate students majoring in bacteriology, but it is also available as a minor to other graduate students in related fields, to whom it is recommended by respective supervising committees and with the approval of the Department of Microbiology. Prerequisites: Bacteriology and Immunology, M221. 4 units per semester. PROFESSOR SMITH

324. RESEARCH SEMINAR ON VIRUSES.—Limited to advanced students. 2 units per semester. PROFESSOR BEARD

325. MEDICAL MYCOLOGY.—This course is intended to familiarize the graduate student majoring in mycology with the fungi causing disease in man and animal. The course includes practical laboratory work with materials from patients in Duke Hospital and those sent to the Duke Fungus Registry from outside sources. Prerequisites: A.M. in Botany with major in mycology and M221. Course limited to four students each year. 4 units per semester. PROFESSOR CONANT

326-327. MICROBIOLOGY SEMINAR.—Graduate students and staff meet weekly to discuss and review recent microbiological literature. Required of all graduate students who are candidates for the A.M. or Ph.D. degree. 2 units.

328. SEMINAR IN IMMUNOLOGY.—Selected topics on various aspects of immunology will be discussed. Seminars will be by both students and faculty. 1 unit. Spring semester. ASSISTANT PROFESSOR METZGAR

PHILOSOPHY

PROFESSOR BAYLIS, CHAIRMAN—212D WEST DUKE BUILDING; PROFESSOR WELSH, DIRECTOR OF GRADUATE STUDIES—212A WEST DUKE BUILDING; PROFESSORS CLARK, NEGLEY, AND PEACH; ASSOCIATE PROFESSOR WILSON; ASSISTANT PROFESSORS BINKLEY AND SPECTOR

The Department of Philosophy offers graduate work leading to the A.M. and Ph.D. degrees. Tutorial work complements formal instruction. Students may specialize in any of the following fields: the History of Philosophy; Logic; Philosophy of Science; Epistemology; Metaphysics; Philosophical Analysis; Ethics; Aesthetics; Political Philosophy and Philosophy of Law. Applicants for admission should offer scores of the Graduate Record Examination or the Miller Analogies Test. Scores are required of applicants for an award.

Individual programs of study are developed for each student. The following requirements, however, are fundamental: (1) In February of their first year new graduate students in philosophy who are not then taking the preliminary examinations for the Ph.D. are required to take three qualifying examinations: one in the history of philosophy, ancient and modern; one on a central philosophical topic, treated systematically; and one in logic, both classical and symbolic. The examination in logic will be waived if, during the first semester, a student has passed with a grade of E or G Philosophy 331c, Logic. A student's achievement on these examinations will be regarded as indicative of his ability to undertake advanced graduate work. (2) Preliminary examinations for the Ph.D., which may be taken only after a student has met the language requirements for that degree, should be taken during the first year of study beyond the A.M. degree, but in any case not later than the end of the second year. In these examinations students are expected to combine historical knowledge with critical understanding.

Work in a minor field outside of the Department, but not necessarily confined to any one department, must include six units for the A.M. or the Ph.D. and may include more as a student's program requires or permits.

FOR SENIORS AND GRADUATES

202. AESTHETICS: THE PHILOSOPHY OF CRITICISM.—A study of some fundamental issues in aesthetics with particular reference to the fields of literature, music and painting. Problems discussed include the role of standards in criticism, aesthetic judgment, interpretation and evaluation in literature, meaning in the arts, art and truth, the arts and morality. 3 units. PROFESSOR WELSH

203. CONTEMPORARY ETHICAL THEORIES.—Study of the nature and justification of basic ethical concepts and principles in the light of the chief ethical theories of twentieth-century British and American philosophers.
PROFESSOR BAYLIS AND ASSISTANT PROFESSOR BINKLEY

205. PHILOSOPHY OF HISTORY.—Discussion of the method, metaphysical implications and influence of interpretations of history: Hegel, Marx, Spengler, Toynbee. 3 units. PROFESSOR NEGLEY

208. POLITICAL VALUES.—Analysis of the systematic justification of political principles and the status of political values in the administration of law. 3 units.
PROFESSOR NEGLEY

211. PLATO.—A critical study of the dialogues with special emphasis on problems in ethics, epistemology, and metaphysics. 3 units.
ASSISTANT PROFESSOR BINKLEY

217. ARISTOTLE.—A study of parts of the *Organon, Physics,* and *Metaphysics.* 3 units. ASSOCIATE PROFESSOR WILSON

219. KANT.—Reading and discussion of his philosophy, with some attention to historical continuity. 3 units.* PROFESSOR NEGLEY

225. BRITISH EMPIRICISM.—A critical study of the writings of Locke, Berkeley, or Hume, with special emphasis on problems in the theory of knowledge. 3 units. (1965-66 Hume) PROFESSOR PEACH

227. CONTINENTAL RATIONALISM.—A critical study of the writings of Descartes, Spinoza, or Leibniz, with special emphasis on problems in the theory of knowledge and metaphysics. 3 units. PROFESSOR PEACH

228. RECENT AND CONTEMPORARY PHILOSOPHY.—A critical study of some contemporary movements in philosophy with special emphasis on the work of Moore, Russell, Wittgenstein, Wisdom, and Ryle. 3 units. PROFESSOR WELSH

229. AMERICAN PRAGMATISM.—Studies in the philosophy of Peirce, James, Dewey, and Mead. 3 units.* PROFESSOR WELSH

230. THE MEANING OF RELIGIOUS LANGUAGE.—An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. Prerequisite: Contemporary Theology 232-233 or consent of instructor. (Also listed as Religion 230.) 3 units. ASSOCIATE PROFESSOR POTEAT

233. INTRODUCTION TO THE PHILOSOPHY OF SCIENCE.—A systematic study of some central problems in the methodology of the sciences, e.g., the concept of a scientific explanation, theory and observation, and other topics. 3 units. (1965-66) ASSISTANT PROFESSOR SPECTOR

234. PHILOSOPHY AND THE SCIENCES.—Selected problems in the physical and non-physical sciences. Topics such as space, time, measurement, probability, and induction, and problems in the philosophy of the behavioral and social sciences. Prerequisite, Philosophy 233. 3 units. (1965-66) ASSISTANT PROFESSOR SPECTOR

235. PHILOSOPHY AND THE SCIENCES.—An introduction to the philosophy of science with emphasis on the writings of philosophers and scientists in the history of science, such as Galileo, Newton, Mach, Poincare, and Einstein. 3 units.
ASSISTANT PROFESSOR SPECTOR

236. SPECIAL PROBLEMS IN THE PHILOSOPHY OF SCIENCE.—Selected topics concerning the methods of the sciences and the philosophy of science. Prerequisite: previous work in the philosophy of science or the consent of the instructor. 3 units. ASSISTANT PROFESSOR SPECTOR

241. LOGIC.—Fundamental Problems of Logic. 3 units.*
PROFESSOR CLARK AND ASSOCIATE PROFESSOR WILSON

246. GENERAL SEMANTICS AND THEORY OF LANGUAGE.—An examination of semantical theory through Frege, Russell, Carnap and Quine, together with a consideration of the implications of meaning theory for general philosophy. 3 units.* ASSOCIATE PROFESSOR WILSON

250. PHILOSOPHICAL ANALYSIS.—A critical study of recent and contemporary essays in philosophical analysis, and an evaluation of the nature, methods, and results of this movement. 3 units.

PROFESSORS BAYLIS, CLARK, AND ASSISTANT PROFESSOR BINKLEY

252. METAPHYSICS.—A critical and evaluative study of rival metaphysical theories and their bases. Analysis of the fundamental metaphysical categories and of metaphysical methods. 3 units. PROFESSOR BAYLIS

287-288. FOUNDATIONS OF MATHEMATICS.—Propositional calculus, predicate calculus, axiomatized number theory. Godel completeness and incompleteness theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 53, or consent of instructor. 6 units. (Also listed as Mathematics 287-288.)

ASSOCIATE PROFESSOR SHOENFIELD

291, 292. CRITICAL PHILOSOPHY.—The analysis of basic philosophical concepts and beliefs with a view to critical evaluation and constructive emendation of them. Emphasis on the practice as well as the principles of philosophical criticism and problem-solving. 3 units each. Enrollment only by permission of the Department. 291 is ordinarily prerequisite for 292.

ALL MEMBERS OF THE GRADUATE STAFF

FOR GRADUATES

331, 332. SEMINAR IN SPECIAL FIELDS OF PHILOSOPHY.—3 units.

ALL MEMBERS OF THE GRADUATE STAFF

PHYSICS

PROFESSOR FAIRBANK, CHAIRMAN—119 PHYSICS BUILDING; PROFESSOR GREULING, DIRECTOR OF GRADUATE STUDIES; PROFESSORS BIEDENHARN, FOWLER, GORDY, LEWIS, MEYER, NEWSON, NIELSEN, SPONER; ASSOCIATE PROFESSOR ROBINSON; ASSISTANT PROFESSORS BILPUCH, EVANS, FORTNEY, MIYAGAWA, ONLEY, ROBERSON, TILLEY, AND WALTER; INSTRUCTORS GUYER, HUNT, AND WINNEWISSER

The Department of Physics offers graduate work leading to the A.M. and Ph.D. degrees. Course work is designed to give a broad basic foundation in classical and modern physics. All graduate students will be expected to acquire a thorough knowledge of the various branches of classical physics and some familiarity with modern physics and with basic laboratory skills. They will be required to take such course work in the 200-number courses as may be necessary to obtain this foundation.

The student will be required to take such course work as will best be adapted to the kind of work he will subsequently specialize in and to the kind of research he will undertake. The choice of minor will be similarly determined.

Since a practical reading knowledge of French and German is highly desirable for the student of physics, he should satisfy these language requirements as early as possible.

FOR SENIORS AND GRADUATES

201-202. MECHANICS.—The fundamental principles of Newtonian mechanics; general dynamics of systems of particles and rigid bodies; the methods of Lagrange and Hamilton; generalized mechanics. Prerequisite: Physics 125. 6 units.

PROFESSOR GREULING

213-214. CONTEMPORARY PHYSICS.—A course which covers the fundamental concepts and the experimental basis of modern physics. 6 units.

ASSISTANT PROFESSOR WALTER

217-218. ADVANCED PHYSICS LABORATORY.—Measurements involving the

fields of mechanics, electricity, magnetism, heat, sound, optics and modern physics. 2-6 units. ASSOCIATE PROFESSOR MEYER

220. ADVANCED ELECTRONICS.—Vacuum tubes and solid state devices, advanced circuit analysis. 3 or 4 units. INSTRUCTOR HUNT

221-222. THEORETICAL PHYSICS.—Mechanics of particles and of rigid bodies, elasticity, fluids dynamics, electrodynamics; optics, relativity, thermodynamics, statistical mechanics, wave mechanics. Prerequisite: Mathematics 285-286 or equivalent to be taken at least concurrently. 6 units. INSTRUCTOR WINNEWISSER

223-224. ELECTRICITY AND MAGNETISM.—Electrostatics, magnetostatics, and potential theory; dielectric and magnetic media; magnetic field of currents and the law of induction. Maxwell's electrodynamics, theory of wave optics, refraction, interference, and diffraction. Prerequisite: Physics 126. 6 units.

ASSOCIATE PROFESSOR ROBINSON

FOR GRADUATES

303, 304. THERMODYNAMICS, STATISTICAL MECHANICS.—Fundamental laws of thermodynamics and statistical mechanics with applications to physics and chemistry. Properties of gases and elements of quantum statistics. 6 units.

INSTRUCTOR GUYER

306. LOW TEMPERATURE PHYSICS.—A study of the properties of matter near the absolute zero of temperature; superconductivity, liquid helium, adiabatic demagnetization. Prerequisite: Physics 303. 3 units. PROFESSOR FAIRBANK

309. SOLID STATE.—A study of matter in the condensed state, including metals, insulators and semiconductors; theory of cooperative effects; thermal and magnetic properties of matter. Prerequisite: Physics 303. 3 units. PROFESSOR MEYER

315-316. PRINCIPLES OF QUANTUM THEORY.—Original and fundamental concepts of quantum theory; wave and matrix mechanics; theory of measurements; exclusion principle and electronic spin. Prerequisite: Physics 201-202. 6 units.

ASSOCIATE PROFESSOR ONLEY

317. INTERMEDIATE QUANTUM THEORY.—General operator methods; angular momentum; Dirac electron theory. Second quantization; symmetry principles and conservation theorems. Applications to the theory of solids, of nuclei, and of elementary particles will be stressed. Prerequisite: Physics 315-316. 3 units.

ASSISTANT PROFESSOR EVANS

319. ELECTROMAGNETIC FIELD THEORY.—Radiation of electric and magnetic multipole fields; special relativity; covariant electrodynamics; Lienard-Wiechert potentials; scattering and dispersion; Hamiltonian field equations. Prerequisite: Physics 223-224. 3 units. PROFESSOR BIEDENHARN

323. THEORY OF ATOMIC SPECTRA.—Excitation of spectra, computation of wave lengths from photographs of spectra, study of the structure of atomic spectra with applications. 3 units.* PROFESSOR SPONER

324. THEORY OF MOLECULAR SPECTRA.—A study of the structure of molecular spectra with applications. 3 units.* PROFESSOR SPONER

331. MICROWAVE RADIATION.—Microwave generators, cavity resonators, transmission lines, radiation propagation and detection. 3 units.* PROFESSOR GORDY

335. MICROWAVE SPECTROSCOPY.—Application of microwaves in the determination of molecular, atomic, and nuclear properties. Stark and Zeeman effects in microwave spectroscopy. Magnetic resonance absorption. 3 units.*

PROFESSOR GORDY

341. ADVANCED TOPICS IN QUANTUM THEORY.—Quantum theory of radiation and collisions with special reference to nuclear and high energy physics. Prerequisite: Physics 315-316. 3 units.* PROFESSOR BIEDENHARN

343. NUCLEAR PHYSICS.—Elementary theory of the deuteron; low energy neutron proton scattering; theory of nuclear reactions; penetration of potential barriers; nuclear energy levels. Prerequisite: Physics 315. 3 units. PROFESSOR NEWSON

344. ADVANCED NUCLEAR PHYSICS.—The deuteron, nuclear forces, scatter-

ing of elementary particles, beta-radiation. Other aspects of nuclear physics susceptible of theoretical interpretation. Prerequisite: Physics 343. 3 units.*

PROFESSOR BIEDENHARN

345. HIGH ENERGY PHYSICS.—Experimental and theoretical aspects of high energy nuclear processes; properties of mesons and hyperons. 3 units.

PROFESSOR FOWLER

346. TOPICS IN THEORETICAL PHYSICS.—The content of this course will vary from year to year. General methods in quantum mechanics such as: group theory and its applications; elementary particle theory; field theory; theory of solids; theoretical nuclear physics; atomic and molecular structure. The topic for Spring 1966 will be group theory. Prerequisite: Physics 315-316. 3 units.

351-352. SEMINAR.—A series of weekly discussions on topics related to the research projects under investigation in the department. 2 units.

ALL MEMBERS OF THE GRADUATE STAFF

PHYSIOLOGY AND PHARMACOLOGY

PROFESSOR TOSTESON, CHAIRMAN—203 MEDICAL SCHOOL; ASSOCIATE PROFESSOR KOSTYO, DIRECTOR OF GRADUATE STUDIES—251 MEDICAL SCHOOL; PROFESSORS F. BERNHEIM, HALL, AND RENKIN; ASSOCIATE PROFESSORS BLUM, DETURK, HOROWICZ, JOHNSON, LONG, AND MOORE; ASSISTANT PROFESSORS HOCHSTEIN, MCMANUS, OTTOLENGHI, SALZANO, AND SOMJEN

In the Department of Physiology and Pharmacology graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate work in physiology or pharmacology a student should have a strong background in basic science including course work in mathematics, chemistry, physics and biology. Students are accepted for graduate work who have undergraduate majors in any of the following areas: biology, chemistry, physics, engineering. A brochure is available from the department which describes the program of study, financial assistance, facilities, and the research activities of the staff.

M204. TOPICS IN MUSCLE PHYSIOLOGY.—This course will cover the following topics: Cellular basis of activity in skeletal, cardiac and smooth muscle; ionic properties of muscle membranes; submicroscopic structure of muscle and the molecular basis of contraction; the problem of electro-mechanical coupling; the mechanics and thermodynamics of muscular contraction; design and control problems for the production of movement in various animals. 2 units.

ASSOCIATE PROFESSOR HOROWICZ

M205. PHYSIOLOGICAL MODELS.—This course is primarily intended for students with some background in electrical engineering. It will cover the following topics: energy transformation and storage in single cells; membrane model circuit diagrams and cable properties; membrane non-linear-current relations: nerve impulse transmission; excitation and inhibition; mechanics and thermodynamics of muscles; electrical analysis of cardiovascular-respiratory systems. 3 units.

ASSOCIATE PROFESSOR MOORE

M260. CELLULAR ASPECTS OF DRUG ACTION.—An introduction to cell-drug interaction with emphasis placed on mechanisms of action and structure-activity relationships of chemical agents. Prerequisites: organic chemistry, introductory animal or plant physiology. Undergraduates by permission of instructors. 1 unit.

PROFESSOR F. BERNHEIM; ASSOCIATE PROFESSOR DETURK AND ASSISTANT PROFESSOR OTTOLENGHI

M261-262. HUMAN PHYSIOLOGY.—Six lectures and twenty laboratory hours per week. Prerequisites: Anatomy M201 and Biochemistry M241 (or equivalents) and at least one year of college physics. Feb.-June. Credits depending on work taken. (Maximum 8 units.)

ALL MEMBERS OF THE GRADUATE STAFF

M271. CONTEMPORARY PHYSIOLOGY.—Contemporary physiology taught from the current literature. Prerequisite: Physiology M261-262 or the equivalent. 4 units.

ALL MEMBERS OF THE GRADUATE STAFF

M279. INTRODUCTORY SEMINAR IN PHYSIOLOGY.—Weekly discussions by the staff outlining the scope of modern physiology. Required of all graduate students majoring in physiology. 1 unit. ALL MEMBERS OF THE GRADUATE STAFF

M365. RESPIRATION AND AERO-PHYSIOLOGY.—A study of the fundamental respiratory processes in living organisms, and of the special physiological responses and adjustments of the individual during high-altitude flight. Lectures, conferences, laboratory. Prerequisites: M261-262 or equivalent. 4 units.
PROFESSOR HALL AND ASSISTANT PROFESSOR SALZANO

M369. PHARMACOLOGY. MODE OF ACTION OF DRUGS.—Studies and discussions of the pharmacological action of drugs in terms of biochemical and physiological processes. Lectures, conferences, and laboratory. Prerequisites: M261-262 or equivalent. 4 units. PROFESSORS F. BERNHEIM AND RENKIN; ASSOCIATE PROFESSORS DETURK AND JOHNSON; ASSISTANT PROFESSORS HOCHSTEIN AND OTTOLENGHI

M370. SEMINAR.—A weekly meeting in which original researches by members of the staff and guests are reported. Required of all graduate students who are candidates for the M.A. or Ph.D. degree. 2 units.
ALL MEMBERS OF THE GRADUATE STAFF

M371. TOPICS IN PULMONARY AND CARDIOVASCULAR PHYSIOLOGY.—This course is concerned with processes which account for exchange of gases with the atmosphere, aeration of the blood, transport of oxygen and carbon dioxide, and exchange of gases at the tissues. Emphasis is placed on classical experiments describing physical factors in thoracic motion, ventilation-perfusion relations, function of hemoglobin as carrier of oxygen and carbon dioxide, flow-pressure relations in the gas and blood streams, and factors which disturb the exchange of gases in the pulmonary and systemic capillaries. Prerequisites: M261-262 or equivalent. 2 units. ASSOCIATE PROFESSOR LONG, AND ASSISTANT PROFESSOR SALZANO

M372. RESEARCH.—Individual investigations in the various fields of physiology. Credits to be arranged. ALL MEMBERS OF THE GRADUATE STAFF

M373. CELLULAR ENDOCRINOLOGY.—Current concepts of the mechanism of action of hormones are covered with special reference made to the effects of hormones on cell membrane permeability and on the activity of enzyme systems. The relationships of these cellular actions of hormones to the hormonial regulation of growth, metamorphosis, osmoregulation, pigmentation and reproduction are discussed. 2 units. ASSOCIATE PROFESSOR KOSTYO

M375. PHYSIOLOGY OF EXCITABLE CELLS.—This course includes the following topics: Membrane circuit diagrams and cable properties; Energy storage and discharge in nerve, muscle; Membrane non-linear voltage-current relations; Axonal and junctional transmission; Cellular organization and electrical activity in skeletal, cardiac and smooth muscle; Electro-mechanical coupling; Thermodynamics of muscle; Mechanics of muscular contraction; and Molecular basis of contraction. 2 units. ASSOCIATE PROFESSORS HOROWICZ AND MOORE

M377. CELLULAR TRANSPORT PROCESSES.—A sequential study of the following topics: The physical chemistry of transport processes which occur in living cells (e.g. diffusion, flow, electric current); contemporary knowledge of the molecular mechanism of salt and water transport across cell membranes with special reference to the conversion of chemical bond energy to transport work in active transport; the integration of transport processes in individual plasma membranes to accomplish regulation of cytoplasmic salt and water composition and cell volume, as well as the secretion of fluids across epithelial cell layers in organs specialized for this function (intestine, kidney). 2 units.
PROFESSOR TOSTESON AND ASSISTANT PROFESSOR MCMANUS

M379. PHYSIOLOGY OF THE CENTRAL NERVOUS SYSTEM.—The literature concerned with the integrative aspects of neurophysiology will be explored with emphasis upon the mammalian nervous system. Topics to be considered include: properties of central neurons, synaptic excitation and inhibition, reflex organization of the spinal cord, receptor organs and sensory codes in the central nervous

system, organization of motor functions and integration of autonomic functions. Prerequisites: Physiology M261-262 or equivalent. 2 units.

ASSISTANT PROFESSOR SOMJEN

POLITICAL SCIENCE

PROFESSOR HALLOWELL, CHAIRMAN—307 LIBRARY; ASSOCIATE PROFESSOR SINDLER, DIRECTOR OF GRADUATE STUDIES—306 LIBRARY; PROFESSORS BALL, BRAIBANTI, COLE, CONNERY, KULSKI, RANKIN, AND WILSON; ASSOCIATE PROFESSORS HALL, LEACH, AND PROCTOR; VISITING ASSOCIATE PROFESSOR HULL

The Department of Political Science offers graduate work leading to the A.M. and Ph.D. degrees. Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the A.M. degree.

Instruction is designed to prepare the student for teaching, for government service, and for other work related to public affairs. Before undertaking graduate study in political science, a student is ordinarily expected to have completed at least 12 semester hours of course work in political science, including some work in American government.

Fields of political science in which instruction is at present offered for candidates for the degree of Doctor of Philosophy are the following: American Government and Constitutional Law; Comparative Government (with special reference to European Institutions, Southern Asia, Soviet Institutions, or Commonwealth Institutions); Political Theory; American State and Local Government; International Law and Organization; Public Administration; Political Parties and Voting Behavior. Candidates for the degree of Doctor of Philosophy who propose to major in political science must elect five fields including Comparative Government and Political Theory; at least one of the five fields must be taken in a department other than the Department of Political Science.

FOR SENIORS AND GRADUATES

207. AMERICAN CONSTITUTIONAL LAW AND THEORY.—A study of leading principles of American government, as developed through judicial interpretation of the Constitution. 3 units. PROFESSOR RANKIN

208. AMERICAN CONSTITUTIONAL LAW AND CURRENT NATIONAL PROBLEMS.—A study of the influence of recent Supreme Court decisions upon the political and constitutional development of the United States. 3 units.

PROFESSOR RANKIN

209. PROBLEMS IN STATE AND LOCAL GOVERNMENT IN THE UNITED STATES.—A study of the historical development of the state and local governments, their present organization and subdivisions and their relation to each other. Special attention is given to the position of the states in the federal union through the study of federal-state, inter-state, and state-local relations. 3 units.

PROFESSOR RANKIN

221. INTERNATIONAL PUBLIC ORGANIZATION.—A study of the structure and functioning of the United Nations organs, of related specialized agencies such as the International Labor Organization, and of regional agencies such as the Organization of American States and the North Atlantic Treaty Organization. 3 units. PROFESSOR WILSON

223. POLITICAL PHILOSOPHY FROM PLATO TO MACHIAVELLI.—An intensive analysis of the political philosophies of Plato and Aristotle followed by a survey of medieval political thought and an analysis of the significance of Machiavelli. 3 units. PROFESSOR HALLOWELL

224. MODERN POLITICAL THEORY.—An historical survey and philosophical analysis of political theory from the beginning of the seventeenth to the middle of the nineteenth century. Attention is given to the rise of liberalism, the Age of Enlightenment, the romantic and conservative reaction, idealism and utilitarianism. 3 units. PROFESSOR HALLOWELL

225. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study

of modern political institutions and processes, with particular attention to European constitutional government and politics. 3 units.
PROFESSOR COLE AND ASSOCIATE PROFESSOR PROCTOR

226. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study of modern political institutions and processes, with particular attention to European totalitarian and authoritarian political systems. 3 units.
PROFESSOR COLE AND ASSOCIATE PROFESSOR PROCTOR

227-228. INTERNATIONAL LAW.—Elements of international law, particularly as interpreted and applied by the United States; rights and duties of states with respect to recognition, state territory and jurisdiction, nationality, diplomatic and consular relations, treaties, treatment of aliens, pacific settlement of disputes, international regulation of the use of force, and collective responsibility. 6 units.
PROFESSOR WILSON

229. RECENT AND CONTEMPORARY POLITICAL THEORY.—The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Christianity and the social order. 3 units. PROFESSOR HALLOWELL

230. AMERICAN POLITICAL INSTITUTIONS.—A study of the formation and development of institutions of the national government in the United States, with historical and analytical treatment. Among other topics, this course is concerned with the Constitutional Convention of 1787, and the development of Congress, the Presidency, and the Supreme Court. 3 units. PROFESSOR RANKIN

231. AMERICAN POLITICAL THEORY.—An analysis of the main currents in American political thought from colonial beginnings to the present day, with emphasis upon the development of liberalism in America. 3 units.*
PROFESSOR HALLOWELL

234. CIVIL-MILITARY RELATIONSHIPS IN AMERICAN GOVERNMENT.—A consideration of the role of the military in American government both in practice and in theory. Special emphasis will be given to formal civil-military structural arrangements for determining policies such as the National Security Council, and to the degree of civilian control within the military establishment. 3 units.*
PROFESSOR CONNERY

235. THE BRITISH COMMONWEALTH.—An analysis of the political relationships between the members of the Commonwealth and a comparative study of the political systems of the Commonwealth countries, with particular reference to Canada. A course designed in part to utilize the occasional services of visiting professors from Commonwealth countries. 3 units. PROFESSOR COLE

241. ADMINISTRATIVE MANAGEMENT.—An advanced course in public administration with special attention being given to the development of scientific management, its application to government in the United States, and a consideration of current problems in organization, procedures, work simplification, and management improvement. 3 units. PROFESSOR CONNERY

242. NATIONAL ADMINISTRATION.—A study of the administrative organization, working concepts and procedures of the United States Government, illustrated through the operations of the Bureau of the Budget. 3 units.
PROFESSOR CONNERY

244. ADMINISTRATIVE LAW AND PROCESS.—The nature and law of the administrative process in the context of American government and politics, with special attention to the powers, procedures, and judicial control of administrative agencies. 3 units. ASSOCIATE PROFESSOR HALL

246. GOVERNMENT ADMINISTRATION AND PUBLIC POLICY.—Through use of the laboratory and case study techniques, a consideration of the types of administrative problems that the United States Government encounters in the field of public policy, and their possible solution. 3 units.* PROFESSOR CONNERY

250. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA I.—Methodology of comparative political analysis. Institutional, functional problem-

atic and culture-analytic approaches compared. Theoretical problems of induced political and administrative change, using India and Pakistan as case studies. 3 units. PROFESSOR BRAIBANTI

251. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA II. Political modernization of India and Pakistan with emphasis on constitutional change, development of ideology, bureaucratic transition, party politics, law as an instrument of political change, and the community development movement. 3 units.

275. THE NATIONAL PARTY SYSTEM.—An intensive examination of selected facets of American national political parties, such as relationships between presidential and congressional politics, the politics of national conventions, and the controversy over party government. 3 units. ASSOCIATE PROFESSOR SINDLER

276. COMPARATIVE STATE PARTIES AND POLITICS.—A selective analysis of party patterns in the states, including such topics as: classification schemes for state party systems, the impact of various nominating procedures on party organization, relationships between national and state politics, and the influence of party system on the operation of state government, with special attention to the South. 3 units. ASSOCIATE PROFESSOR SINDLER

280. COMPARATIVE GOVERNMENT AND POLITICS—SUB-SAHARAN AFRICA.—Particular attention will be given to traditionalism and modernization, ideologies, leadership, party systems, the adaptation of parliamentary institutions, Africanization of the civil services, and the problem of political integration. 3 units. ASSOCIATE PROFESSOR PROCTOR

291. PROBLEMS OF URBAN GOVERNMENT.—An analysis of problems arising from the structure and functions of urban governments in the United States with particular attention to the current problems of metropolitan areas. 3 units. PROFESSOR RANKIN AND ASSOCIATE PROFESSOR LEACH

292. URBAN ADMINISTRATION.—A study of the administration of governmental programs and policies by governments in metropolitan areas with special attention to problems of organization, jurisdiction, and administrative responsibility. 3 units. PROFESSOR RANKIN AND ASSOCIATE PROFESSOR LEACH

321. SEMINAR IN POLITICAL THEORY.—Open to students who have completed 6 units in Political Science 223, 224, 229, 231 or their equivalents. 3 units. PROFESSOR HALLOWELL

325. SEMINAR IN COMPARATIVE GOVERNMENT.—Open to students who have completed courses 225 or 226 or equivalents. 3 units. PROFESSOR COLE

328. SEMINAR IN INTERNATIONAL LAW.—Open to students who have completed course 227-228 or its equivalent. 3 units. PROFESSOR WILSON

330. SEMINAR IN COMPARATIVE GOVERNMENT AND POLITICS—SOUTHERN ASIA.—Emphasis on research using documentary materials relating to India, Pakistan, Ceylon, and Malaya. Open to students who have completed courses 250, 251 or their equivalents. 3 units. PROFESSOR BRAIBANTI

341. SEMINAR IN PUBLIC ADMINISTRATION.—Directed reading, discussion and reports concerning the theory and practice of public administration. 3 units. PROFESSOR CONNERY

360. SEMINAR IN RUSSIAN GOVERNMENT.—Open to students who have completed courses 226 or 260, or on individual approval by the instructor. 3 units. PROFESSOR KULSKI

361. SEMINAR IN FOREIGN RELATIONS OF THE SOVIET UNION.—Open to students who have completed courses 226 or 260 or 360, or on individual approval by the instructor. 3 units. PROFESSOR KULSKI

376. SEMINAR IN POLITICAL BEHAVIOR.—Open to students who have completed courses 275 and 276 or their equivalents, or by special approval of the instructor. 3 units. ASSOCIATE PROFESSOR SINDLER

401. SEMINAR IN THE BRITISH COMMONWEALTH.—3 units. PROFESSORS COLE, HAMILTON, SPENGLER, AND BRAIBANTI

410. SEMINAR IN THE GOVERNMENT, HISTORY, AND SOCIAL STRUCTURE OF INDIA AND PAKISTAN.—3 units.

PROFESSOR BRAIBANTI AND ASSOCIATES

RELATED COURSE WORK IN THE SCHOOL OF LAW

There may be graduate credit for course work completed in the Duke University School of Law, under regulations referred to on page 24 of this *Bulletin*.

PSYCHOLOGY

PROFESSOR ALEXANDER, CHAIRMAN, 240 PSYCHOLOGY-SOCIOLOGY BUILDING; PROFESSOR GUTTMAN, DIRECTOR OF GRADUATE STUDIES, 103 PSYCHOLOGY-SOCIOLOGY BUILDING; PROFESSORS ADAMS, DAI, DIAMOND, JONES, AND KIMBLE; ASSOCIATE PROFESSORS BANHAM, BONEAU, BORSTELMANN, BREHM, CARSON, LAKIN, AND WALLACH; ASSOCIATE RESEARCH PROFESSOR GAFFRON; ASSISTANT PROFESSORS ALTROCCHI, ERICKSON, GREENWOOD, KREMEN, AND SCHIFFMAN; LECTURERS COHEN, CROVITZ, EISDORFER, GEHMAN, KRUGMAN, OBRIST, PEELE, SHMAVONIAN, SOMJEN, STEDMAN, AND THOMPSON

The Department offers work leading to the A.M. and Ph.D. degrees. For the Ph.D. degree the areas of concentration are: theoretical experimental psychology, including physiological and comparative psychology; social psychology; and personality clinical psychology. All fields of specialization presuppose thorough preparation in the general methods, data, and theories of psychology. Programs of study are typically arranged to provide this common background in the first year or two, with increasing specialization in course work and research in subsequent years. Early in the second year of residence, the Ph.D. student is expected to have planned his further program of specialized studies; by the end of the second year, when the preliminary examination is normally taken, the doctoral dissertation plan should be formulated. An original dissertation demonstrating independent research competence and scholarship is the most important formal requirement for the Ph.D. degree.

Students specializing in clinical psychology undertake field work in a variety of settings, and an integral part of this program is a one-year internship in an approved and appropriate institution. Clinical internship is arranged for the third year of study or later year, depending on the student's progress and needs.

Minor work in a variety of fields is available, but the areas most relevant to graduate work in psychology are the biological sciences (zoology, neuroanatomy, physiology), mathematics and statistics, sociology and anthropology, and philosophy of science.

Further details concerning the program of studies in psychology may be obtained from the Director of Graduate Studies in Psychology.

203. PSYCHOLOGY OF PERCEPTION.—An examination of current systematic formulations with emphasis upon the intensive analysis of a variety of representative investigations. 3 units.

204. COMPARATIVE PSYCHOLOGY.—The study of behavior as related to species and of speciation as dependent upon behavior; instinct, imprinting, and learning at different phylogenetic levels. 3 units. PROFESSOR ADAMS

209. EXPERIMENTAL METHODS IN PSYCHOLOGY.—A study of methods for the identification, control, and recording of essential variables in psychological situations, with emphasis upon the relation of experimental techniques to problem formulation. Laboratory, lectures, and discussions. 3 units. PROFESSOR KIMBLE

210. COGNITION AND HIGHER MENTAL PROCESSES.—An intensive analysis of the literature on thinking, problem-solving, creativity, language and related topics. Emphasis is upon the functional significance of these aspects of intellectual activity and upon the experimental methodology involved in their study. 3 units.

213, 214. CONDITIONING AND LEARNING.—A survey of the literature on classical and instrumental conditioning and other forms of simple learning. Emphasis is on classical conditioning in 213 and on instrumental behavior in 214. 3 to 6 units. PROFESSORS GUTTMAN AND KIMBLE

215. DEVELOPMENTAL PSYCHOLOGY.—A consideration of selected research areas in child behavior and development, including personality, cognition, perception and learning. 3 units. ASSOCIATE PROFESSOR BORSTELMANN

216. BIOLOGICAL PSYCHOLOGY.—The methods of biology (as applied to psychology), especially in neurophysiology, neuroanatomy and genetics. Topics covered include: (a) the genetics of behavior, (b) the organization of the dorsal thalamus and neocortex, (c) the limbic system and hypothalamus. Methods covered include: (a) ablation method, (b) method of evoked potentials, (c) electrical stimulation of the brain, (d) classical and physiological genetics. 3 units.
PROFESSOR DIAMOND

217. RESEARCH METHODS IN SOCIAL PSYCHOLOGY.—The theory and practice of data collection methods in social psychology. Emphasis is on the interplay between design and technique. The methods covered include formal scaling procedures, systematic observational techniques and others appropriate to field studies, field experiments, surveys and laboratory experiments. 3 units.
ASSOCIATE PROFESSOR BREHM

218. SOCIAL PSYCHOLOGY.—An examination of selected problem areas in social psychology including social factors in cognition, models of social interaction, conformity and social influence, and attitude development and change. Recent research is emphasized in relation to its historical context and its bearing on the development of theory. 3 units. PROFESSOR JONES

220. PHYSIOLOGICAL BASES OF BEHAVIOR.—Classical studies on the neuropsychology of learning and behaviors such as hunger, thirst and sex are examined. The central role of neuroendocrinology in providing an understanding of the physiological bases of motivated behavior is discussed. 3 units.

223. PSYCHOPHYSICS AND SENSORY SYSTEMS.—A consideration of the origins, concepts, and methods of psychophysics in conjunction with an examination of sensory systems, primarily hearing, as studied by psychophysical methods. 3 units.
LECTURER GREENWOOD

234. SEMINAR IN PERSONALITY.—A detailed consideration of selected research topics of current interest in the experimental study of personality, including risk-taking, creativity, and cognitive styles. 3 units. ASSOCIATE PROFESSOR WALLACH

236. THEORETICAL PSYCHOLOGY.—This course is devoted to the analysis of techniques of theory construction in psychology. The discussion of these methodological issues is co-ordinated with the analysis of concrete formulations in contemporary psychology theory. 3 units.

237. FUNCTIONAL NEUROPHYSIOLOGY.—This course considers the mechanisms of activity of the individual neuron and groups of nerve cells, the principles of activity of the afferent and efferent neural systems, and the integrative and associative functions of the nervous system. Laboratory demonstrations and participation. 3 units. ASSISTANT PROFESSOR ERICKSON

238. THE ELECTROENCEPHALOGRAM AND PSYCHOLOGICAL FUNCTION.—A survey of experimental and clinical literature on brain wave correlates of intelligence, personality, behavior disorders, epilepsy, sleep, sensory stimulation, conditioning and learning. Lectures, laboratory demonstrations, and clinical case presentations. 3 units. LECTURER OBRIST

239. BEHAVIORAL CORRELATES OF BRAIN DAMAGE IN MAN.—A study of the effects of brain damage on psychological functioning. Known brain-behavior relationships in man will be reviewed, and problems encountered in the study of brain function in man will be emphasized. Laboratory demonstrations will be concerned with the assessment of cerebral dysfunction through the use of standard psychological tests. 3 units. LECTURER THOMPSON

245, 246. PERSONALITY THEORY.—An examination of representative models

of human functioning from Freud to the present day. Included are examples from psychoanalytical, field theoretical, and behavioristic approaches. 3 units each semester. PROFESSOR ALEXANDER AND ASSISTANT PROFESSOR KREMEN

247, 248. PERSONALITY ASSESSMENT.—Introduction to the assessment of human personality through the study of personal documents, interview data, objective and projective test material. Laboratory sessions will be concerned with personality assessment of normal human subjects over extended time periods. 3 units each semester. PROFESSOR ALEXANDER AND ASSISTANT PROFESSOR KREMEN

253, 254. PERSONALITY DEVELOPMENT.—A survey of behaviors and concepts relating to personality functioning through the life span from infancy to old age. Laboratory sessions will involve the study of individuals in natural and experimental contexts by observation and testing. 3 units each semester.
ASSOCIATE PROFESSOR BORSTELMANN AND STAFF

265. FUNDAMENTAL STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—Introduction to probability and the use of statistics in description and hypothesis testing in psychology including the following applications: correlation techniques, chi-square and t tests, distribution-free tests and one-way analysis of variance. 3 units. ASSOCIATE PROFESSOR BONEAU

266. ADVANCED STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—The basic theory and applications of analysis of variance techniques to complex experimental designs will be covered. Additional advanced techniques, including factor analysis, will be introduced. Prerequisite: Psychology 265 or equivalent. 3 units. ASSOCIATE PROFESSOR BONEAU

271 a-d. SEMINAR IN SELECTED PROBLEMS.—3 units each.

273. PRINCIPLES OF PSYCHOLOGICAL MEASUREMENT.—Psychological measurement will be discussed in the context of the theoretical questions which motivate research, and the related demands of scientific inference. Topics will include methods of psychometric scaling and test construction, as well as selected methods for data analysis. Prerequisite: Psychology 265 or equivalent. 3 units.
ASSISTANT PROFESSOR SCHIFFMAN

282. INTRODUCTION TO METHODS IN PSYCHOTHERAPY.—Current trends in psychotherapeutic practice and research are discussed, as a means of introducing the student to the field. Emphasis is upon the application of principles drawn from theories of personality to individual and group psychotherapy. Discussions of selected readings and some field experience in therapy are included. 3 units. ASSOCIATE PROFESSOR LAKIN

292. THE HISTORY OF PSYCHOLOGY.—3 units. PROFESSOR ADAMS

FOR GRADUATES

305. PSYCHOPATHOLOGY.—An examination of behavior disorders, with particular emphasis on explanatory concepts and the evidence from research in this field. 3 units. LECTURER COHEN

306. SEMINAR IN DEVELOPMENT PSYCHOLOGY.—2 or 3 units.
PROFESSOR ADAMS

309. SEMINAR IN LEARNING.—3 units. PROFESSOR KIMBLE

310. SEMINAR IN PERCEPTION.—3 units.

311. SEMINAR IN INSTRUMENTAL BEHAVIOR.—3 units.
PROFESSOR GUTTMAN

312. SEMINAR IN THEORETICAL PSYCHOLOGY.—3 units.

316. SEMINAR IN SOCIAL PSYCHOLOGY.—3 units. PROFESSOR JONES

318. SEMINAR IN SOCIAL INFLUENCE.—3 units.
ASSOCIATE PROFESSOR BREHM

324. SEMINAR: BEHAVIORAL STUDIES OF THE BRAIN.—3 units.
PROFESSOR DIAMOND

335-336. CLINICAL PSYCHOLOGY PRACTICUM.—Seminar discussion and supervised field experience in the application of basic psychological procedures and

principles to clinical cases in a variety of institutional settings. Prerequisite: Psychology 245, 246, 247, and 248. 1 to 6 units each of two semesters. STAFF

337. SEMINAR IN SENSORY DISCRIMINATION.—A study of the neural bases of discrimination. 3 units. ASSISTANT PROFESSOR ERICKSON

341. PRINCIPLES OF PSYCHOTHERAPY, I.—Contributions from psychoanalysis, psychology, and social sciences will be reviewed to form a unified framework for understanding and treatment of behavior disorders. Emphasis on the problems characteristic of man living in society and culture and on principles of psychotherapy required by the human needs for consistency, self-esteem and self-realization. Selected case material will be used. Prerequisite: Psychology 282. 3 units. PROFESSOR DAI

342. PRINCIPLES OF PSYCHOTHERAPY, II.—Application of principles of psychotherapy in a detailed examination of interviews conducted by students. Emphasis on the role of therapist's personality in the therapy process and on problems of technique. Prerequisite: Psychology 341. 3 units. PROFESSOR DAI

343, 344. ADVANCED SEMINAR IN CLINICAL PSYCHOLOGY.—1 to 3 units each semester. STAFF

371. PRE-SCHOOL BEHAVIOR PROBLEMS.—The diagnostic evaluation of behavior development in infants and preschool children. The nature and causation of developmental anomalies. (Physical handicaps and social conditions in relation to intellectual and personality development.) Preventive and remedial measures. 3 units. ASSOCIATE PROFESSOR BANHAM

RELIGION

PROFESSOR BEACH, DIRECTOR OF GRADUATE STUDIES—209 DIVINITY SCHOOL; PROFESSORS ANDERSON, CLARK, CUSHMAN, HENRY, LACY, PETRY, PRICE, STINESPRING; ASSOCIATE PROFESSORS BAKER, GRISLIS, HERZOG, HILLERBRAND, OSBORN, SULLIVAN; ASSISTANT PROFESSORS LANGFORD, ROBINSON, STRUGNELL; LECTURER WINTERMUTE

The Department of Religion offers graduate work leading to the A.M. and Ph.D. degrees. Students may major in one of three fields: (1) Biblical Studies; (2) Historical Studies; and (3) Systematic and Contemporary Studies. They will be expected to take such courses in one or both of the other fields as will conduce to an adequate understanding of their chosen fields of specialization.

In addition to course work in these major fields, students will take such other courses in cognate fields as will contribute to the enrichment of their major studies.

This minor requirement may be fulfilled either by work in a cognate department, such as Ancient Language and Literature, History, or Political Science, or by work in a cognate field within the Department of Religion other than the field of major concentration.

The program of doctoral studies presumes a grounding in religion such as is normally derived from the course content of theoretical subjects of a seminary curriculum. Candidates for admission to the doctoral program are favored, therefore, who hold a B.D. degree from an accredited seminary or who have had at least two years of seminary study beyond the B.A. degree. Students applying for graduate work in religion directly from an undergraduate program should have had a strong undergraduate major in religion, and will be accepted for the Ph.D. program only on the condition of satisfactory completion of the M.A. degree with the department.

Candidates for the Ph.D. degree must complete the language requirements in both French and German not later than the beginning of the second year of residence.

FIELD I. BIBLICAL STUDIES

201-202. FIRST HEBREW.—The principles and structure of the Hebrew language with translation of selected Old Testament narratives. 6 units.
PROFESSOR STINESPRING

207. SECOND HEBREW.—Historical Hebrew grammar with reading and exegesis of Old Testament prose (the Pentateuch and historical books in alternate years). First semester. 3 units. STAFF

208. SECOND HEBREW.—Historical Hebrew grammar with reading of Old Testament poetry (the Prophets and the Writings in alternate years). Second semester. 3 units. STAFF

209. BIBLICAL THEOLOGY.—A study of the Old and New Testaments in regard to their theological relationship. 3 units. PROFESSOR ANDERSON

226. EXEGESIS OF THE GREEK NEW TESTAMENT I.—A. Mark and Matthew; B. Romans; C. Colossians and Ephesians. (N.T. 226 A, N.T. 226 B, and N.T. 226 C are separate courses, offered in different semesters.) 3 units. PROFESSOR PRICE

227. EXEGESIS OF THE GREEK NEW TESTAMENT II.—A. Luke-Acts; B. Galations and I Corinthians; C. The Pastoral Epistles; D. The Apocalypse. (N.T. 227 A, N.T. 227 B, N.T. 227 C, N.T. 227 D are separate courses, offered in different semesters.) 3 units. PROFESSOR ANDERSON

228. THE THEOLOGY OF THE GOSPEL AND EPISTLES OF JOHN.—A study of the origin of these writings; the provenance of their thought forms and symbolism; their influence on the early church; and contemporary significance. 3 units. PROFESSOR PRICE

301. THE THEOLOGY OF THE DEAD SEA SCROLLS.—A study of the religious ideas of the Scrolls in relation to the theology of the Old and New Testaments. 3 units. ASSISTANT PROFESSOR STRUGNELL

302. STUDIES IN THE INTERTESTAMENTAL LITERATURE.—Selected documents of the Apocrypha and Pseudepigrapha examined exegetically and theologically in their relation to Post-Exilic Judaism. Prerequisite: Permission of the instructor. 3 units. PROFESSOR ANDERSON

304. ARAMAIC.—A study of the Aramaic portions of the Old Testament, and selected passages from the Targums, Midrashes, and Talmuds. 3 units. PROFESSOR STINESPRING AND ASSISTANT PROFESSOR STRUGNELL

305. THIRD HEBREW.—An interpretative study of late Hebrew prose, with readings from Chronicles, Ecclesiastes, and the Mishnah. 3 units. PROFESSOR STINESPRING

306. LANGUAGE AND LITERATURE OF THE DEAD SEA SCROLLS.—A study in interpretation. Prerequisite, a knowledge of Hebrew. 3 units. ASSISTANT PROFESSOR STRUGNELL

307. SYRIAC.—A study of the script and grammar, with readings from the Syriac New Testament and other early Christian documents. Some knowledge of Hebrew and Aramaic prerequisite. 3 units. PROFESSOR STINESPRING

309. HISTORY OF THE ANCIENT NEAR EAST.—A specialized study of the civilizations of Egypt, Palestine, Syria, and Mesopotamia in the light of Biblical archaeology. 3 units. PROFESSOR STINESPRING

310. OLD TESTAMENT PROPHECY.—The prophetic movement in Israel with special emphasis on the theological standpoint of the prophets of the eighth century B.C. 3 units. PROFESSOR STINESPRING

318. TEXTUAL CRITICISM OF THE NEW TESTAMENT.—A study of the scientific recovery of the Greek text on which modern versions are based; manuscript discoveries; principles of textual criticism; practice in collating original manuscripts in the Duke collection. 3 units. PROFESSOR CLARK

340-341. SEMINAR IN THE NEW TESTAMENT.—Research and discussion on a selected problem in the Biblical field. 2 units. PROFESSORS ANDERSON AND PRICE

FIELD II. HISTORICAL STUDIES

234. THE THEOLOGY OF THOMAS AQUINAS.—A systematic interpretation of the thought of Aquinas, with a major emphasis on his specifically theological formulations, drawing upon the *Summa Theologica* and other relevant sources. 3 units. ASSOCIATE PROFESSOR GRISLIS

240. THE THEOLOGY OF RICHARD HOOKER.—An exposition of the writings of the systematic theologian of Anglicanism in the sixteenth century. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR GRISLIS

250. STUDIES IN MODERN CHURCH HISTORY, I. REFORMATION AND COUNTER-REFORMATION.—History and thought of European Christianity between 1517-1680. (Also listed as History 225.) 3 units.
ASSOCIATE PROFESSOR HILLERBRAND

251. STUDIES IN MODERN CHURCH HISTORY, II: PIETISM AND RATIONALISM.—History and thought of Christianity on the continent of Europe between 1680-1800. 3 units. ASSOCIATE PROFESSOR HILLERBRAND

260. SEMINAR: WESLEY STUDIES.—The lives and thought of John and Charles Wesley and their colleagues in relation to English culture and religion in the 18th century. 3 units. ASSOCIATE PROFESSOR BAKER

279. RELIGIONS OF EAST ASIA.—A study of the major traditions of China and Japan with emphasis on the development and expansion of Buddhism. 3 units.
ASSOCIATE PROFESSOR SULLIVAN

280. THE HISTORY OF RELIGIONS.—A study of the methodology of the history of religions, the nature of religious experience, and specific categories of religious phenomena. 3 units. ASSOCIATE PROFESSOR SULLIVAN

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the main sources and traditions of the classical civilization of the Indian sub-continent, with particular attention to religious movements and institutions. (Also listed as History 285.) 3 units. ASSOCIATE PROFESSOR SULLIVAN

296. RELIGION ON THE AMERICAN FRONTIER.—A study of the spread of evangelical Christianity as a theological and cultural phenomenon of the American West. 3 units. PROFESSOR HENRY

322. NINETEENTH-CENTURY EUROPEAN THEOLOGY.—Protestant theology from Kant to Herrman together with representative British theologians. 3 units.
ASSOCIATE PROFESSOR HERZOG

331. THE SOCIAL MESSAGE OF THE EARLY AND MEDIEVAL CHURCH. A study of the social teachings and contributions of the Christian Church prior to the Protestant Reformation. 3 units. PROFESSOR PETRY

332. THE MEDIEVAL CHURCH.—Outstanding characteristics of the Medieval Church, emphasizing theory, polity, institutions, sacraments, and worship. 3 units. (Not 1965-66) PROFESSOR PETRY

334. CHURCH REFORMERS AND CHRISTIAN UNITY.—The work of such reformers as Marsilius of Padua, William Ockham, Jean Gerson, Pierre d'Ailly, and Nicholas of Cusa in relation to ecclesiastical schism and the search for Christian unity through representative councils. 3 units. PROFESSOR PETRY

336. CHRISTIAN MYSTICISM IN THE MIDDLE AGES.—Source studies in historical perspective of such late medieval mystics as Bernard of Clairvaux, the Victorines, Ramon Lull, Meister Eckhart, Richard Rolle, Catherine of Siena, and Nicholas of Cusa. 3 units. (Not 1965-66) PROFESSOR PETRY

337. THE THEOLOGY OF MARTIN LUTHER.—A critical and comparative examination of Luther's thought. 3 units. ASSOCIATE PROFESSOR HILLERBRAND

338. THE THEOLOGY OF JOHN CALVIN.—An exposition of the *Institutes of the Christian Religion* in relation to cognate documents. 3 units. (Not 1965-66)
ASSOCIATE PROFESSOR GRISLIS

339. LEFT-WING MOVEMENTS OF THE REFORMATION.—A survey of the history and theology of the "radical" Reformation. 3 units.
ASSOCIATE PROFESSOR HILLERBRAND

387. CHRISTIAN ETHICS AND SOCIAL PHILOSOPHY.—Selected social philosophies from Locke to Sumner analyzed from the standpoint of Christian ethics. 3 units. PROFESSOR LACY

391. HISTORICAL TYPES OF CHRISTIAN ETHICS I.—A critical study of representative statements of Christian ethical theory, through the early Reformation. 3 units. PROFESSOR BEACH

392. HISTORICAL TYPES OF CHRISTIAN ETHICS II.—A continuation of C.E. 391, from the Reformation through current Christian ethical theory. Prerequisite: C.E. 391. 3 units. PROFESSOR BEACH

395. CHRISTIAN THOUGHT IN COLONIAL AMERICA.—Exposition of the main currents in Protestant theology. 3 units. PROFESSOR HENRY

396. LIBERAL TRADITIONS IN AMERICAN THEOLOGY.—A study of the main types of modern religious thought, beginning with the theology of the Enlightenment. 3 units. PROFESSOR HENRY

FIELD III. SYSTEMATIC AND CONTEMPORARY STUDIES

210. BRITISH THEOLOGY.—A study of twentieth-century British Theology. Attention will be given to the Anglican, Free Church, and Scottish traditions. 3 units. ASSISTANT PROFESSOR LANGFORD

230. THE MEANING OF RELIGIOUS LANGUAGE.—An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. 3 units. (Also listed as Philosophy 230)
ASSOCIATE PROFESSOR POTEAT

231. SEMINAR IN CHRISTIANITY AND CONTEMPORARY THOUGHT.—Analytical reading and discussion of such critical cultural analysis as is found in the works of M. Polanyi, Arendt, Trilling, and others, with appraisal of the relevance for theological inquiry. 3 units. ASSOCIATE PROFESSOR POTEAT

248. THE THEOLOGY OF KARL BARTH.—An historical and critical study of the theology of Karl Barth. 3 units. ASSOCIATE PROFESSOR OSBORN

292. CHRISTIAN ETHICS AND INTERNATIONAL RELATIONS.—An examination of Christian attitudes toward such issues as war and peace, the rule of law, foreign aid, and human rights; and the Church's contribution to international policies and institutions. 3 units. PROFESSOR LACY

303. DOGMA AND THE PROBLEM OF HISTORY.—The authority of Kerygma and the Word of God in contemporary European theology. 3 units.
ASSOCIATE PROFESSOR HERZOG

320. SEMINAR: SCHLEIERMACHER.—A critical examination of the dogmatic system. 3 units. ASSOCIATE PROFESSOR HERZOG

325. PHILOSOPHICAL THEOLOGY I.—Main problems in the history of philosophical theology. 3 units.
ASSISTANT PROFESSOR ROBINSON OR PROFESSOR CUSHMAN

326. PHILOSOPHICAL THEOLOGY II.—Prolegomena to the system of Christian theology. 3 units. ASSISTANT PROFESSOR ROBINSON OR PROFESSOR CUSHMAN

328. TWENTIETH-CENTURY EUROPEAN THEOLOGY.—Critical examination of the thought of selected representative theologians. 3 units. (Not 1965-66)
ASSOCIATE PROFESSOR HERZOG

333. SEMINAR: MARXIST IDEOLOGY AND CHRISTIAN FAITH.—Comparative study of Communist and Christian doctrines of man, society, sin, history, ethics, and eschatology. 3 units. PROFESSOR LACY

380. EXISTENTIALISM.—An exploration of the interests and motifs of Existentialism in relation to modern philosophy and theology through an analysis of representative writings of Kierkegaard, Heidegger, Berdyaev, Marcel, and Sartre. 3 units. ASSOCIATE PROFESSOR POTEAT

385. RELIGION IN AMERICAN LITERATURE.—A critical study of the meaning and value of religious motifs reflected in American literature. 3 units.
PROFESSOR HENRY

386. SEMINAR: THEOLOGICAL TRENDS IN THE WORLD CHURCH.—Contemporary currents of Christian thoughts as they affect resurgent non-Christian faiths, new formulations of a theology of mission, and ecumenical conversations. 3 units. PROFESSOR LACY

389. CHRISTIAN ETHICS AND CONTEMPORARY CULTURE.—A study of the interaction between Christian thought and current secular social theory. 3 units. (Not 1965-66) PROFESSOR BEACH

390. CURRENT PROBLEMS IN CHRISTIAN ETHICAL THEORY.—A critical study of dominant issues in Christian ethics, through an analysis of a variety of contemporary Christian treatments of such problems as love, justice, community, and vocation. 3 units. PROFESSOR BEACH

394. CHRISTIANITY AND THE STATE.—The relation of the Christian theory of the State to political problems, with special consideration of the religious assumptions underlying democratic theory and practice and of the relationship of church to state. 3 units. (Not 1965-66) PROFESSOR BEACH

397. CONTEMPORARY AMERICAN THEOLOGY.—Critical appraisal of major tendencies. 3 units. PROFESSOR HENRY

398. COLLOQUIUM ON THE COLLEGE AND UNIVERSITY TEACHING OF RELIGION.—The theological issues of religion in higher education; a consideration of the curricular content of religion courses. Normally expected of Level III students in Fields I, II, and III in residence. PROFESSOR BEACH AND STAFF

ROMANCE LANGUAGES

PROFESSOR FEIN, CHAIRMAN—205 FOREIGN LANG.; PROFESSOR CHERPACK, DIRECTOR OF GRADUATE STUDIES—310 FOREIGN LANG.; PROFESSORS CASTELLANO, DAVIS, DOW, FOWLIE, PREDMORE, AND WARDROPPER; ASSOCIATE PROFESSORS CORDLE, GRANT, AND VINCENT; ASSISTANT PROFESSORS BUSH, HULL, AND TETEL

The Department of Romance Languages offers graduate work leading to the A.M. and Ph.D. degrees. In order to undertake graduate study in this Department, the student should normally have credit for four years of college courses in the chosen language, or 18 semester hours beyond the conventional two units offered at entrance to college. In addition to this minimum requirement, the student should have had one semester of review in composition and grammar.

It is recommended that candidates for the A.M. degree take a second Romance language as the minor subject.

A candidate for the Ph.D. degree will be required to take some training in Romance linguistics, the amount to be determined by the Department upon consideration of the student's preparation in the field, and a course in the methods of literary scholarship.

FRENCH

FOR SENIORS AND GRADUATES

209. ADVANCED COMPOSITION AND SYNTAX.—A detailed study of the morphological and syntactic structure of the French language; practice in writing various styles of French; vocabulary study. 3 units. ASSISTANT PROFESSOR HULL

210. FRENCH PHONETICS.—The phonemic structure of contemporary French. Sounds, intonation. Practice transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied to French. 3 units. ASSISTANT PROFESSOR HULL

213. FRENCH CLASSICISM.—Its initial phase. Reading from Malherbe, Balzac, Voiture, Descartes, Corneille, Molière, and others. 3 units. (1965-66) PROFESSOR CHERPACK

214. FRENCH CLASSICISM.—Its maturity. Readings from Pascal, Racine, La Fontaine, La Rochefoucauld, Boileau, Bossuet, Madame de Sévigné, La Bruyére, Saint-Simon, and others. 3 units. (1965-66) PROFESSOR CHERPACK

217. MALLARMÉ AND RIMBAUD.—The symbolism and the formal elements in Mallarmé's poetry. The poetic theory and the psychic elements in Rimbaud's poetry. 3 units. (Not 1965-66) PROFESSOR FOWLIE

219. OLD FRENCH LITERATURE.—An introduction to the reading of Old French literary texts. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR VINCENT

221. THE NINETEENTH-CENTURY FRENCH NOVEL.—Its initial phase. The Romantic hero in conflict with society, with special emphasis on the works of Stendhal and Balzac. 3 units. (1965-66) ASSOCIATE PROFESSOR GRANT

222. THE NINETEENTH-CENTURY FRENCH NOVEL.—Its continuation. The decline of the individual hero. Flaubert and Zola will receive intensive study. 3 units. (1965-66) ASSOCIATE PROFESSOR GRANT

223. FRENCH LITERARY CRITICISM.—A history of critical theory in France and a study of the major critics from the Renaissance to today. 3 units. (Not 1965-66) PROFESSOR FOWLIE

225, 226. FROM RENAISSANCE TO BAROQUE IN FRENCH LITERATURE OF THE SIXTEENTH CENTURY.—First semester: Literary prose. Readings from Jean Lemaire de Belges, Marguerite de Navarre, Rabelais, Montaigne, and others. Second semester: Poetry and theater. Readings from Marot, Sceve, Labé, Saint Gelais, the Pléiade, d'Aubigné, Sponde, Du Bartas, Garnier, and others. (1965-66) ASSISTANT PROFESSOR TETEL

228. FRENCH POETRY OF THE TWENTIETH CENTURY.—In the wake of symbolism: Valéry and Claudel; poetry as ritual; Péguy; Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John Perse. 3 units. (Not 1965-66) PROFESSOR FOWLIE

233. CONTEMPORARY FRENCH THEATER.—A study of dramatic theory; the art of the leading directors; and the major texts of Claudel, Giraudoux, Anouilh, Sartre, Beckett, Ionesco, Genet, etc. 3 units. (1965-66) PROFESSOR FOWLIE

234. PROUST.—A study of *A la recherche du temps perdu*. The thematic structure and the aesthetics of the work. 3 units. (Not 1965-66) PROFESSOR FOWLIE

236. BAUDELAIRE.—A study of the poetry and the criticism of Baudelaire as contributing to the origins of modern art and literature. 3 units. (Not 1965-66) PROFESSOR FOWLIE

241, 242. FRENCH LITERATURE AND THOUGHT IN THE AGE OF ENLIGHTENMENT.—First semester: The new philosophy and its propagation. Lectures and discussions involving texts by Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and others. Second semester: The crisis in literary aesthetics. Readings, lectures, and discussions bearing on the clash between Classicism and new literary orientations. 6 units. (1965-66) PROFESSOR CHERPACK

245. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—1895-1925: The metamorphoses of symbolism. A study of the works of Proust, Gide, and Claudel. 3 units. (1965-66) ASSOCIATE PROFESSOR CORDLE

246. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—1925-1955: The existentialist conversion. A study of the work of Malraux, Sartre, Camus. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR CORDLE

248. FRENCH LITERATURE OF THE TWENTIETH CENTURY: THREE MODERN PROPHETS.—Extensive reading from Bloy, Péguy, Bernanos. 3 units. (Not 1965-66) ASSISTANT PROFESSOR BUSH

FOR GRADUATES

311, 312. FRENCH SEMINAR.—Each semester one of the following topics will be selected for intensive treatment: (a) Studies in Sixteenth-Century Literature, (b) Studies in Eighteenth-Century Literature, (c) Studies in Nineteenth-Century Literature, (d) Studies in Seventeenth-Century French Literature, (e) Studies in Contemporary Literature. 3 units each semester.

PROFESSORS CHERPACK AND FOWLIE; ASSOCIATE PROFESSORS CORDLE AND GRANT; ASSISTANT PROFESSOR BUSH AND TETEL

—.GRADUATE READING COURSE. An intensive course in French to develop rapidly the ability to read French in several fields. Graduate students only. No credit.

ITALIAN

FOR SENIORS AND GRADUATES

288. THE RENAISSANCE.—Petrarch, Boccaccio, and Ariosto. 3 units. ASSISTANT PROFESSOR TETEL

SPANISH

FOR SENIORS AND GRADUATES

251. THE ORIGINS OF THE SPANISH NOVEL.—A critical study, based on close readings and discussions, of selected examples of the principal genres of the early novel: the *Amadis de Gaula, Diego de San Pedro's La cárcel de amor,* the *Abencerraje,* the *Lazarillo,* Montemayor's *Diana.* 3 units. (Not 1965-66)
PROFESSOR WARDROPPER

252. SPANISH LYRIC POETRY BEFORE 1700.—A critical study, based on close reading and discussion, of selected poems of the Middle Ages, Renaissance and Baroque. Special emphasis on the *Razón de amor, la poesía de tipo tradicional,* and Santillana; on Garcilaso, San Juan de la Cruz, Fray Luis de León, and Herrera; on Góngora and Quevedo. 3 units. (1965-66) PROFESSOR WARDROPPER

253. THE ORIGINS OF THE SPANISH THEATER.—A study of the evolution of the Spanish theater from the *Auto de los Reyes Magos* (12th century) through the end of the 16th century. The idea of the theater as dramatic poetry will be stressed; close reading of texts by Gómez Manrique, Encina, Gil Vicente, Torres Naharro, Lope de Rueda, Juan de la Cueva. 3 units. (Not 1965-66)
PROFESSOR WARDROPPER

255. MODERN LATIN-AMERICAN LITERATURE.—The coming of age of Latin-American literature in the nineteenth and twentieth centuries, with particular attention to the Modernist movement. 3 units. (Not 1965-66) PROFESSOR FEIN

256. CONTEMPORARY LATIN-AMERICAN LITERATURE.—Trends in Latin-American literature after the Modernist movement. Analysis of significant works in various genres. 3 units. (1965-66) PROFESSOR FEIN

258. OLD SPANISH LITERATURE.—An introduction to the reading of Old Spanish literary texts. 3 units. (1965-66) PROFESSOR DAVIS

259. SPANISH PHONETICS.—A phonemic approach to the study of Spanish sounds. Remedial pronunciation drills with special emphasis on rhythm and intonation. Readings in current studies of phonology. 3 units.
PROFESSOR CASTELLANO

260. ADVANCED COMPOSITION AND SYNTAX.—Study of fundamental difficulties in the language; practice in writing idiomatic Spanish; exercises in free composition. For students who have a satisfactory command of Spanish grammar and fair conversational ability. 3 units. PROFESSOR CASTELLANO

261. NINETEENTH-CENTURY NOVEL.—A study of literary and social trends in the last half of the nineteenth century. Readings will be selected from the novels of Valera, Pereda, Galdós, Pardo, Barzán, Blasco Ibánez, and their contemporaries. 3 units. (Not 1965-66) PROFESSOR DAVIS

264. MODERN AND CONTEMPORARY SPANISH THEATER.—A brief review of modern and contemporary Spanish theater from the period of Romanticism. Lectures, reading and discussion of the most representative works of Benavente, los hermanos Quintero, Garcia Lorca, Casona, etc. 3 units. (1965-66)
PROFESSOR CASTELLANO

265. GOLDEN AGE LITERATURE: CERVANTES.—The life and works of Cervantes with special emphasis on his *Quijote.* 3 units. PROFESSOR PREDMORE

266. GOLDEN AGE LITERATURE: THE DRAMA.—Study of the chief Spanish dramatists of the seventeenth century with readings of representative plays of this period. 3 units. (1965-66) PROFESSOR CASTELLANO

275. CONTEMPORARY SPANISH LITERATURE.—The essay and lyric poetry. A study of the revision of national values and literary expression in the twentieth century with particular reference to the crisis of 1898 and to the enrichment of the Spanish tradition through extra-peninsular influences. 3 units. (Not 1965-66)
PROFESSOR PREDMORE

276. CONTEMPORARY SPANISH LITERATURE.—The novel. A study of tradition and innovation in the twentieth-century Spanish novel with emphasis on the novels of Unamuno, Baroja, Valle Inclán, and Pérez de Ayala. 3 units. (1965-66) PROFESSOR PREDMORE

FOR GRADUATES

321, 322. HISPANIC SEMINAR.—Each semester one of the following topics will be selected for intensive treatment: (a) The Spanish Language in America, (b) Studies in Medieval Literature, (c) Studies in the Literature of the Golden Age, (d) Studies in Latin American Literature, (e) Studies in the Spanish Renaissance and Baroque, (f) Studies in Spanish Poetry, (g) Studies in Nineteenth-Century Spanish Literature. 3 units each semester.

PROFESSORS CASTELLANO, DAVIS, FEIN, PREDMORE, AND WARDROPPER

ROMANCE LANGUAGES

211. APPROACHES TO ROMANCE LITERATURE.—An introduction to the most significant ways in which Romance literature has been divided and studied, with analyses of selected texts. 3 units. PROFESSOR CHERPACK

218. THE TEACHING OF ROMANCE LANGUAGES.—Evaluation of objectives and methods; a study of the practical problems involved in teaching these languages on the elementary, secondary, and college levels; analysis of textbooks, special foreign language programs, audio-visual aids; critical examination of modern techniques in written and oral testing. 3 units. PROFESSOR DOW

224. ROMANCE LINGUISTICS.—The origin and development of the Romance languages from spoken Latin to the modern standard languages and local dialects. Introduction to contemporary methods in historical and comparative linguistics. 3 units. ASSISTANT PROFESSOR HULL

RUSSIAN

ASSOCIATE PROFESSOR JEZIERSKI

No graduate degree is presently offered in Russian. The following courses may serve in the minor programs of students in other departments.

201, 202. THE NOVELISTS OF NINETEENTH-CENTURY RUSSIA.—Development of the Russian novel against the European background, with emphasis on Dostoevskij and Tolstoj. Extensive readings in English. Lectures, oral reports, class discussions, and term paper. 6 units. ASSOCIATE PROFESSOR JEZIERSKI

SOCIOLOGY AND ANTHROPOLOGY

PROFESSOR MCKINNEY, CHAIRMAN—2681 BUILDING #9; PROFESSOR KERCKHOFF, DIRECTOR OF GRADUATE STUDIES—271 BUILDING #9; PROFESSORS BACK, LA BARRE, MADDOX, AND THOMPSON; ASSOCIATE PROFESSORS MCCORMACK, PREISS, ROWE, ROY, AND SMITH; ASSISTANT PROFESSOR WINSBOROUGH

The Department offers graduate work leading to the A.M. and Ph.D. degrees in Sociology. Before undertaking advanced work in this department, a student must have completed a minimum of twelve semester hours of approved preliminary courses in the field, and twelve additional semester hours in the field or in related work. Applicants for admission should submit scores on the Graduate Record Examination, especially the Aptitude Test.

Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the A.M. degree. Candidates for the Ph.D. degree are expected to have a broad background in the various aspects of sociology—substantive, theoretical, and empirical. The program of each candidate is determined by a committee which reviews his previous work and sets the specific requirements to be met. These requirements will include work in related fields such as psychology, philosophy, mathematics, economics, or political science. Emphasis is placed on the completion of the dissertation, directed by a member of the staff, demonstrating competence and independence in the investigation of an original and significant problem.

Further details of the program, the departmental facilities, the staff, and various stipends available are described in a brochure which may be obtained from the Director of Graduate Studies in Sociology.

FOR SENIORS AND GRADUATES

230. SOCIETY AND CULTURE IN INDIA.—The basic features of Indian cultures and societies from an anthropological perspective. The impact of selected technological and social changes upon the individual, caste and community. 3 units. ASSOCIATE PROFESSOR ROWE

232. PRIMITIVE RELIGION.—The ethnography, the social functions, and the socio-psychological meanings of religion in primitive societies. 3 units. PROFESSOR LA BARRE

234. PERSONALITY AND SOCIETY.—The sociology and social psychology of human personality, its origins in the primary group, its nature and varieties and its integrations into secondary group institutions. 3 units. PROFESSOR LA BARRE

236. PERSONALITY AND CULTURE.—The influence of culture patterns and social institutions upon character structure, socialization of the individual, and the dynamics of human personality. Comprehensive anthropological materials will be drawn upon. Prerequisite: Course 234. 3 units. PROFESSOR LA BARRE

238. LANGUAGE AND SOCIETY.—An introduction to the study of language and society. Universal features of language, language as a mirror of society and social perception through language, language as a coding system, linguistics and anthropology, applied linguistics. 3 units. ASSOCIATE PROFESSOR MCCORMACK

241. SOCIAL STRATIFICATION.—The nature of hierarchical and vertical differentiation in the economic, political and prestige structures in modern societies. The interrelationship of class, status and power strata and their influence on social institutions, personality structure, and group and individual behavior. 3 units. ASSOCIATE PROFESSOR ROY

242. THE SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS.—The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 3 units. PROFESSOR MCKINNEY AND ASSOCIATE PROFESSOR ROY

243. POPULATION DYNAMICS AND SOCIAL CHANGE.—The aim of this course is to introduce the student to the facts and techniques of demographic analysis, and to provide an understanding of the relationship between the demographic structure of society and its social organization. 3 units. ASSISTANT PROFESSOR WINSBOROUGH

245. DEVIANT SOCIAL BEHAVIOR.—Analysis of deviant behavioral systems (illness, crime, delinquency, etc.) in terms of a) precipitating social factors, b) patterns and goals, c) remedial and counteracting controls. 3 units. ASSOCIATE PROFESSOR PREISS

247. COMMUNITY AND SOCIETY.—This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, news, mass behavior, social problems, races and classes. 3 units. PROFESSOR THOMPSON

253. SOCIAL INSTITUTIONS.—The study of particular institutions and the social movements out of which they developed, with emphasis on the development of general propositions concerning the nature, function and importance of institutions in society. 3 units. PROFESSOR THOMPSON

255. RACE AND CULTURE.—A comparative study of race relations in world perspective developed around such themes as races and personal identity, the geography and ecology of race relations, the idea of race, and race conflict. 3 units. PROFESSOR THOMPSON

272. THE SOCIALIZATION PROCESS.—A consideration of the universal societal requirement for replacement of socialized personnel with major concentration on the process in Western society. Particular attention is given to variations in socialization by position in the social structure (class, caste, urban-rural, etc.) and to the contributions made by various socialization agencies (family, school, peer groups, mass media). 3 units. PROFESSOR KERCKHOFF

275. SOCIAL ATTITUDES AND INDIVIDUAL BEHAVIOR.—Such issues as

the following are considered: the importance of symbolic interaction, the development of the "self," the social structuring of the socialization process, individual movement within the social structure, and the importance of membership groups and reference groups. 3 units. PROFESSORS BACK AND KERCKHOFF

278. SOCIAL STRUCTURE AND THE LIFE CYCLE.—A study of the relationship between age as a social characteristic and social interaction, with particular reference to adolescence and old age. 3 units. PROFESSOR MADDOX

281. DEVELOPMENT OF SOCIOLOGICAL THEORY.—An analysis of the development, convergence and utilization of sociological theory. Prerequisite: 15 s.h. credit in sociology. 3 units. PROFESSOR MCKINNEY AND ASSOCIATE PROFESSOR PREISS

282. PRINCIPLES OF SOCIOLOGICAL ANALYSIS.—An advanced course in general sociology designed to give a systematic conception of social order, focusing on its structural components and the functions they serve. Undergraduates must have at least 15 s.h. and a B average in sociology and have the permission of the instructor. 3 units.* PROFESSOR THOMPSON

295. METHODOLOGY IN SOCIOLOGY.—Considerations of the nature of scientific method, as well as alternative paths to knowledge, as they apply to sociology. Conceptualization, hypothesis formation, and definition. The research process as a decision-making situation both on the general level of research design and the specific level of special techniques. The process and logic of data analysis. Relations of theory and research are stressed. 3 units. ASSOCIATE PROFESSOR SMITH

297. STATISTICAL ANALYSIS IN SOCIOLOGY.—Such techniques as zero and higher order linear and curvilinear correlation, partial correlation, analysis of variance and covariance and factorial design are studied. Where possible, analogous non-parametric techniques are also considered. Prerequisite: Mathematics 233 or an equivalent course. Undergraduates must have at least 15 s.h., a B average in sociology and obtain the permission of the instructor. 3 units.
ASSISTANT PROFESSOR WINSBOROUGH

FOR GRADUATES

330. SEMINAR IN ANTHROPOLOGY.—A seminar for advanced students who wish to pursue individual studies in racial and cultural anthropology. Offered both semesters. 1 to 3 units each semester. PROFESSOR LA BARRE AND ASSOCIATE PROFESSORS MCCORMICK AND ROWE

341. SPECIAL PROBLEMS OF COMPLEX SYSTEMS.*

(a) INDUSTRIAL AND PROFESSIONAL SYSTEMS.—Analysis of problems of organization of work in such diverse settings as industrial plants, hospitals, and public administration groups. Problems of decision-making, recruitment, allocation of authority, informal organization, interorganizational relations. 3 units.
PROFESSOR MCKINNEY AND ASSOCIATE PROFESSOR ROY

(b) MASS COMMUNICATIONS.—Theoretical problems in defining and distinguishing communication, communicative acts, communication processes, and communication systems. Work aimed toward the derivation of models and theories for each of these will be pursued. Students must have permission of the instructor or have had at least 6 units in some of the following courses: 142, 171, 172, 275, 373, 374. 3 units. ASSOCIATE PROFESSOR SMITH

(c) URBAN SOCIETY.—Analysis is made of the varying mechanisms through which urban society is integrated, how urbanites develop a sense of identification with the community, and the extent and mode of social dominance of the city in the larger society. 3 units. PROFESSOR THOMPSON AND ASSOCIATE PROFESSOR SMITH

(d) HUMAN ECOLOGY.—An examination of such issues as: the logic and utility of the ecological approach; the possibility of testing current ecological theories in non-western, non-urban environment; alternative explanations for the spatial patterning of social phenomena; selected methodological problems. 3 units.
PROFESSOR THOMPSON, ASSOCIATE PROFESSOR SMITH, AND ASSISTANT PROFESSOR WINSBOROUGH

351, 352. SEMINAR IN SOCIAL ORGANIZATION.—Examination of such prob-

lems as the bases of social cohesion and continuity, the sources and effectiveness of social control mechanisms, the problem of social change in structural-functional theory. 3 units each semester.

PROFESSORS MADDOX, MCKINNEY, AND THOMPSON

373, 374. SOCIAL PSYCHOLOGICAL ISSUES IN SOCIOLOGY.—Detailed exploration of selected problem areas such as the theory and measurement of social attitudes, role discontinuity and personality disorders, applications of reference group theory, the socialization process. Students must have permission of the instructor or have had at least 6 units in some of the following courses: 142, 171, 172, 275, 341b. 3 units each semester. PROFESSORS BACK AND KERCKHOFF

385, 386. SEMINAR IN SOCIOLOGICAL THEORY.—Detailed analysis of methodological and substantive problems in utilizing comprehensive, middle-range, and discrete theories in varied sociological areas. Major emphasis on the use of theory in empirical research. Open to students who have had 281 or its equivalent. 3 units each semester. PROFESSORS MCKINNEY AND THOMPSON; ASSOCIATE PROFESSOR PREISS

392. INDIVIDUAL RESEARCH IN SOCIOLOGY.—Students will conduct on an individual basis research designed to evaluate a sociological hypothesis of their choice. The process must be completely by preparation of a report on this research in adequate professional style. Prerequisite: Sociology 295 or permission of the instructor. 3 units each semester. PROFESSORS BACK AND KERCKHOFF, AND ASSOCIATE PROFESSOR SMITH

397, 398. SEMINAR IN SPECIAL RESEARCH PROBLEMS.—Treatment in depth of either selected methodological issues and/or methods. Examples of possible topics include scaling, methods of machine data processing, validation and induction, quantification, interviewing, measurement, sampling plans, development of research designs from statistical models, methodological research, experimental techniques, the relation of theory to research, and the role of statistical methods in sociology. Open to students by permission of the instructor. 3 units each semester.* PROFESSOR BACK, ASSOCIATE PROFESSOR SMITH, ASSISTANT PROFESSOR WINSBOROUGH

410. SEMINAR IN THE GOVERNMENT, HISTORY, AND SOCIAL STRUCTURE OF INDIA AND PAKISTAN. 3 units.*

ASSOCIATE PROFESSORS MCCORMICK, ROWE, AND ASSOCIATES

ZOOLOGY

PROFESSOR HORN, CHAIRMAN, 227 BIOLOGICAL SCIENCES BUILDING; ASSOCIATE PROFESSOR LIVINGSTONE, DIRECTOR OF GRADUATE STUDIES, 042 BIOLOGICAL SCIENCES BUILDING; PROFESSORS BOOKHOUT, GRAY, GREGG, HUGHES-SCHRADER, MENZIES, SCHMIDT-NIELSEN, WILBUR; ADJUNCT PROFESSOR STEFANSSON; ASSOCIATE PROFESSORS BAILEY, FLUKE, HUNTER, KLOPFER, VERNBERG, WAINWRIGHT, WARD; ASSISTANT PROFESSORS COSTLOW, TUCKER

To undertake study toward an advanced degree in zoology, a student should have completed an undergraduate major in zoology or its equivalent. This normally amounts to 24 or more hours of course work distributed among various fields of zoology. The department recognizes the trend in modern biology towards interdisciplinary research and part of the zoology requirements may be replaced by advanced work in chemistry, mathematics, physics, etc.

Required work for the A.M. degree ordinarily includes 12 units of advanced course work in zoology, 6 units of course work in a minor department, and an additional 6 units of advanced work in the major or minor department, or in other pertinent departments. Furthermore, an acceptable thesis is necessary for the fulfillment of the degree requirements.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of zoology, courses in the minor subject, wide reading in science in general and in biology in particular, research,

and a dissertation based on original work. Minor work is available in many fields, including anatomy, biochemistry, botany, chemistry, geology, physics, physiology and psychology.

FOR SENIORS AND GRADUATES

201. ANIMAL BEHAVIOR.—A review of the major developments in the field with emphasis on recent physiological and developmental studies. Prerequisites: Physiology, Genetics and Evolution, or consent of instructor. 3 units; 4 units with laboratory. (1965-66) ASSOCIATE PROFESSOR KLOPFER

203. ECOLOGY.—Relation of animals to environment. Lectures, reading, reports, conferences; laboratory and field work. 4 units. (See also Marine Laboratory.) PROFESSOR GRAY

210. EXPERIMENTAL GENETICS.—The relation of phenotype to genome and environment; cytogenetics, recent research in the field of genetics. Laboratory. Prerequisites; Principles of heredity (one of the following: Zoology 110, Botany 101, 202, or equivalent) or consent of instructor. 4 units. (Not 1965-66) ASSOCIATE PROFESSOR WARD

214. BIOLOGICAL OCEANOGRAPHY.—Composition in time and space of marine biosphere in relation to descriptive marine chemistry, physics, and geology. Some work at sea aboard the Research Vessel. Prerequisites: A course in Invertebrate Zoology, Ecology, Marine Biology or an appropriate equivalent. Chemistry through organic. One year of Physics and Mathematics. 4 units. (*Given at Beaufort.*) PROFESSOR MENZIES

216. LIMNOLOGY.—A study of lakes, ponds, and streams, including their origin, development, geochemistry, energy balance, productivity, and the dynamics of plant and animal communities living in them. Lectures, field trips, laboratory work. Prerequisites: one year each of biology, chemistry, and physics and Mathematics 21; or permission of instructor. 4 units. (Not 1965-66) ASSOCIATE PROFESSOR LIVINGSTONE

22. ENTOMOLOGY.—Anatomy, physiology, embryology, and classification of insects. Prerequisite: one year of zoology. 4 units.* PROFESSOR GRAY

224. VERTEBRATE ZOOLOGY.—A study of life histories, adaptations, ecology, and classification of vertebrate animals. Prerequisite: Zoology 53. 4 units. (1965-66) ASSOCIATE PROFESSOR BAILEY

228. EXPERIMENTAL EMBRYOLOGY.—Lectures, readings, reports, and laboratory work. 4 units. (1965-66) PROFESSOR GREGG

238. SYSTEMATIC ZOOLOGY.—The fundamental theory and practice involved in the collection, identification, and classification of animals. Prerequisite: Zoology 1, 2. 4 units (Not 1965-66) ASSOCIATE PROFESSOR BAILEY

243. CYTOLOGY.—The structure of the cell. Lectures, readings, reports, and laboratory work. Prerequisites: Zoology 53, 92, 156, or equivalent and consent of instructor. (This is the same course as Botany 203.) 4 units. STAFF

245. RADIATION BIOLOGY.—Actions of ionizing and excitational radiations on life processes: a survey and an adventure in biophysics. Prerequisites: college physics and mathematics, organic chemistry. 3 units, or 4 units with laboratory. (1965-66) ASSOCIATE PROFESSOR FLUKE

246. MOLECULAR BIOLOGY.—The nature, functional relationships and replication of biological structure of the molecular level. Laboratory projects optional by arrangement. Prerequisites: College physics, mathematics, and organic chemistry. Biochemical and genetic background are suggested. 3 units, or 4 with instructor's advanced approval of laboratory work. (Not 1965-66) ASSOCIATE PROFESSOR FLUKE

247. BIOLOGICAL NUCLEONICS.—Laboratory instruction in biological uses of radioactive tracers, primarily with microörganisms, in counting instruments and measurements, and in legal requirements. Prerequisites: by consent of the instructor and normally two years of biology and one year of college chemistry. 2 units. (1965-66) ASSOCIATE PROFESSOR FLUKE

250. PHYSIOLOGICAL ECOLOGY OF MARINE ANIMALS.—A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla from various habitats are studied. Prerequisite: A course in physiology. 6 units. (*Given at Beaufort*)
ASSOCIATE PROFESSOR VERNBERG

252. COMPARATIVE PHYSIOLOGY.—The physiological mechanisms of animals studied on a comparative basis. Prerequisite: Zoology 151 or equivalent. 4 units.
PROFESSOR SCHMIDT-NIELSEN

253. ADVANCED VERTEBRATE MORPHOLOGY.—Descriptive and experimental studies in comparative vertebrate morphogenesis. Lectures, readings, reports, and laboratory. Prerequisites: Zoology 53, 92. 4 units.* PROFESSOR HORN

271. CELLULAR PHYSIOLOGY.—The physiological processes of living matter approached through studies of cells. Prerequisites: two years of biology and at least one year of chemistry. 4 units. PROFESSOR WILBUR

274. INVERTEBRATE ZOOLOGY.—A study of structure, functions, and habits of invertebrate animals under normal and experimental conditions. Field trips will be made to study, collect, and classify animals in their natural habitats. Prerequisites: Zoology 1 and 2. 4 units.* (See also Marine Laboratory)
PROFESSOR BOOKHOUT

276. PROTOZOOLOGY.—The morphology, physiology, taxonomy, and culture of protozoa. Prerequisites: Zoology 1 and 2. 4 units.* PROFESSOR BOOKHOUT

278. INVERTEBRATE EMBRYOLOGY.—Lectures, readings, and laboratory work dealing with rearing, development, and life history of invertebrates. Prerequisite: Zoology 92. 4 units.* PROFESSOR BOOKHOUT

FOR GRADUATES

351, 352. DEPARTMENTAL SEMINAR.—A weekly meeting of graduate students and faculty to hear reports and to discuss biological facts, theories, and problems. One hour a week throughout the year. 1 unit credit by arrangement.
ALL MEMBERS OF THE GRADUATE STAFF

353, 354. RESEARCH.—Students who have had proper training may carry on research under direction of members of the staff in the following fields: (A) Embryology, (B) Physiology, (C) Cytology, Histology, (D) Invertebrate Zoology, (E) Ecology, (F) Morphology, (G) Parasitology, (H) Vertebrate Zoology, (I) Limnology, (J) Entomology, (K) Genetics, (L) Biophysics, (M) Animal Behavior, (N) Systematics, (O) Oceanography. Hours and credits to be arranged.
ALL MEMBERS OF THE GRADUATE STAFF

355, 356. SEMINAR.—One or more seminar courses in particular fields are given each semester by various members of the staff. These will be in the fields indicated under courses 353-354 above. 2 units.

MARINE LABORATORY.—The following courses will be given at Duke University Marine Laboratory, Beaufort, N. C., during the summer of 1965: 203, Marine Ecology; 250, Physiological Ecology of Marine Animals; 274, Marine Invertebrate Zoology. Students with the proper training may register for 353 and 354, Research in Zoology.

MASTER'S DEGREE FOR STUDENTS SPECIALIZING IN PHYSICAL THERAPY

Students specializing in physical therapy may request admission to the Graduate School and if admitted follow the curriculum for the Master of Arts degree of either the Anatomy or Physiology Department. Selected physical therapy subjects are integrated with the graduate courses the first year. A thesis and the remaining physical therapy courses and practicum may be completed the second year. Upon satisfactory completion of the requirements a Master of Arts degree and a Certificate in Physical Therapy will be awarded. For information concerning the Physical Therapy Program write Miss Helen Kaiser, Director, Physical Therapy Department, Box 3247, Duke University Medical Center.

Advanced Degrees

ADVANCED DEGREES CONFERRED JUNE 1, 1964

MASTER OF ARTS

Nadhla Abdul-Halim
Parker B. Albee, Jr.
Victor B. Anthony
Beulah M. Ashbrook
Norman Gerald Barrier
Francis Joseph Battaglia
Robert W. Batten
Joan Blake
Brian Layton Blakeley
John Ernest Boliek
Rebecca Sue Burns
Robert George Butts
James Edwin Byers
James K. Coward
Ruth E. Dowling
Charles Peter Driscoll
Jim W. Evers
Leonard S. Fink
Jane Lamarr Flemister
George S. Friedman
Gerado A. Godoy
Roy Neil Graves, II
Jerry Allen Herndon
Mathilda M. Hills
Ava L. Honeycutt, Jr.
Thomas Charles Hood
Aurobindo J. Jani
Charlie Frank Joiner
Dewey Lynn Kerbow
Sung Kyu Kim
Ellenor Milling Kinard
David Bates Knight
Andre J. Larocque
Charles T. Ludington, Jr.
Richard Martyn Macht
Gary Leroy Maris
Mildred A. McDow
Jamal Modirzadeh
Thomas Bruce Mowbray
Frank Joseph Mullen
Howard Paul Meyers
Charlene M. Nelson
Leonard J. Newell, Jr.
Edward Barry Rich
George David Richards
Michael D. Richards
Charles Stanley Rooks
William Seale, Jr.
Richard Appleton Sherwood
June Emma Steffensen
Barbara Day Taylor
Maaja Harms Washington
Charles N. Watson, Jr.
Kay Eugenia Weston
Jack C. Williams
Jay Reigle Williams
George Robert Wills
Mary Elizabeth Wirtensou

MASTER OF ARTS IN TEACHING

Rebecca L. Baird
Elizabeth Anne Braswell
Linda S. Cartwright
Thomas Bethel Colviu
Carol Young Drummond
Rachel Dailey Morton
Peter Leslie Quasius
Patricia Ann Reardon
Winifred Glass Rogers

MASTER OF EDUCATION

Clara Stott Carter
Charles H. Dickens
Mary Patricia Hill
Martha Ann Sewell

MASTER OF SCIENCE

Robert Newell Alexander
Paul Robert Bengel
Louis Bowles Bresee, Jr.
George Kyle Coffin
Don Richard Denton
Bobby Ray Farris
Charles D. Jamerson, Jr.
William T. Kendrick
Jack T. Lightle
Ted Lee Lightle
John Barry Link
Mayrant Simons, Jr.

MASTER OF HOSPITAL ADMINISTRATION

Richard Alden Byrnes
Ralph H. Holthouser, Jr.
Boi Jon Jaeger
Christopher Johnstou, VI
Francis Foote Manning
David Randall Page
Keuneth John Schoonhagen
Carl Vernon Strayhorn, Jr.
William Lee Yates

DOCTOR OF EDUCATION

Anthony C. Fortosis, B.S., Lehigh University; M.B.A., New York University; M.S., Columbia University
(Education) Dissertation: "A Study of Certain Characteristics of the Christian High Schools Holding Membership in the National Association of Christian Schools"

Eloise Rallings Lewis, B.S., Vanderbilt University; M.S., Uuiversity of Pennsylvania
(Education) Dissertation: "Faculty Appointment Practices in the Collegiate Schools of Nursing in the Southern Region Which Offer Nationally Accredited Programs"

Ralph R. Napp, B.A., University of Alabama
(Education) Dissertation: "Isolation and Analysis of Certaiu Factors Which May Influence Students to Enroll at East Caroliua College"

Fred W. Sandusky, B.A., University of Florida; Th.M., Southern Baptist Theological Seminary; M.A., Appalachian State Teachers College
(Education) Dissertation: "The Admissions Practices aud Procedures to the Bachelor of Divinity Program of Studies of the Accredited Protestant Theological Seminaries in the United States"

Margaret Jaeger Wallace, Duke University School of Nursing; B.S.N.Ed., M.A. Duke University
(Education) Dissertation: "The Relationship Between Behavioral Traits, Self Concept, and Performance of Pediatric Nursing Students"

DOCTOR OF PHILOSOPHY

Gordon Edward Baird, B.S., California Institute of Technology; M.S., Rice University
(Physics) Dissertation: "An Investigation Into Operator Structures On S_{u_n} With Application To A Generalization of the Racah-Wigner Angular Momentum Calculus"

Michael Bassett, B.A., M.A., University of Auckland
(History) Dissertation: "The Socialist Party of America, 1912-1919: Years of Decline"
Kenneth Lee Brown, A.B., McPherson College; B.B., Bethany Biblical Seminary
(Religion) Dissertation: "Washington Gladden: Exponent of Social Christianity"
Susan Templeton Brownlee, B.A., Sterling College
(Biochemistry) Dissertation: "Studies on Galactosamine Uronic Acid and Other Acid Amino Sugars Obtained from VI Antigen-Producing Bacteria"
Richard Leonard Capwell, A.B., Brown University; M.A., Yale University
(English) Dissertation: "A Biographical and Critical Study of John Crowne"
Maximo J. Cerame-Vivas, B.S., University of Puerto Rico
(Zoology) Dissertation: "The Distributional Pattern of Benthic Invertebrates of the Continental Shelf Off North Carolina"
John M. Chamberlin, B.S., Western Kentucky State
(Chemistry) Dissertation: "Potentiometric and Polarographic Studies in Molten Salt Solvents"
Mahinder Datt Chaudhry, B.A., E.P.U., Camp College; M.A., Delhi College
(Economics) Dissertation: "Regional Accounting Within India"
Robert Cherniak, B.S., The College of the City of New York
(Biochemistry) Dissertation: "Metabolism of Sulfated Heteropolysaccharides 'Active Sulfate,' Its Chemical Synthesis and Biological Role"
George B. Clemans, B.S., Virginia Polytechnic Institute
(Chemistry) Dissertation: "I. Some Reactions of the 9, 10-Dihydrodicyclo-Pentadiene Oxides; II. The Stereochemistry of Some 1- and 2-Substituted Dicyclopentadiene Derivatives"
Paul Lee Clouser, B.S., Drexel Institute of Technology
(Physics) Dissertation: "Millimeter and Submillimeter Wave-Spectroscopy of The Alkali Chlorides"
James Lawrence Cole, A.B., Oberlin College; B.S., Princeton University
(Psychology) Dissertation: "The Relationship Between Force Gradients and Rate Gradients In Stimulus Generalization"
James Richard Coleman, B.S., St. Peter's College; M.S., New York University
(Zoology) Dissertation: "Fine Structure and Cytochemistry of the Meiotic Chromosome of The Domestic Rooster *Gallus Domesticus*"
John Childs Courtney, B.A., University of Manitoba; M.B.A., University of Western Ontario
(Political Science) Dissertation: "Canadian Royal Commissions of Inquiry, 1946 to 1962: An Investigation Of An Executive Instrument Of Inquiry"
Bruce Collina Creeson, B.A., Wake Forest College; B.D., Th.M., Southeastern Baptist Theological Seminary
(Religion) Dissertation: "Israel and Edom: A Study of the Anti-Edom Bias in Old Testament Religion"
Elaine K. Crovitz, B.A., Brooklyn College
(Psychology) Dissertation: "Visual Discrimination Learning in Elderly Subjects"
Tyler Deierhoi, B.A., University of Richmond
(History) Dissertation: "The Conduct of German Policy at the General Disarmament Conference of 1932"
Lyman Douglas DeNike, A.B., Harvard University
(Psychology) Dissertation: "Awareness in Verbal Conditioning: The Assessment of Awareness From Verbal Reports Written by Subjects During Conditioning"
Samuel Adrain Dickson, Jr., B.S., University of Alabama
(Physics) Dissertation: "Nuclear Resonance of Some Solidified Gases Under High Pressure"
Lewis Dunbar Dove, B.S., M.S., University of Maryland
(Botany) Dissertation: "Relationship Between Water Stress and Organic Nitrogen Constituents of Tomato Leaves"
Roderick Bruce Dugliss, A.B., Stetson University
(Political Science) Dissertation: "The Church of England as a Pressure Group in Recent British Politics, 1950-1960: The Effectiveness of Establishment"
Frank Edwin Eakin, Jr., B.A., University of Richmond; B.D., Southern Baptist Seminary
(Religion) Dissertation: "The Relationship of Yahwism and Baalism During The Pre-Exilic Period"
John Alden Farrell, B.S., Texas Christian University
(Physics) Dissertation: "Neutron Resonances in the Nickel Isotopes and Other Intermediate Nuclei"
Maria Clelia Ganoza, B.S., Rollins College
(Biochemistry) Dissertation: "The Role of Lipid in Glucose-6-Phosphates"
David Gerke, B.A., Rice Institute
(Physics) Dissertation: "C^{12} (d,p) C^{13}: Distorted Wave-Born Approximation Analysis of Proton Angular Distributions and Proton-Gamma Angular Correlations"
Neal Cephas Gillespie, B.A., Emory University
(History) Dissertation: "George Frederick Holmes and the Philosophy of Faith"
Rajagopalan T. Govindachari, B.S., Presidency College, Madras; M.S., University Biochemical Laboratory, Madras
(Biochemistry) Dissertation: "Studies of Bovine Fructosediphosphatase"
Jack P. Hailman, A.B., Harvard University
(Zoology) Dissertation: "The Ontogeny of an Instinct: The Pecking Response in Chicks of the Laughing Gull (*Larcus atricilla* L.) and Related Species"
Cary Smith Henderson, A.B., A.M., University of Florida
(History) Dissertation: "Congressman John Taber of Auburn: Politics and Federal Appropriations, 1923-1962"

William Barner Huntley, Jr., A.B., Duke University; B.D., Yale University
(Religion) Dissertation: "Christ The Bridegroom: A Biblical Image"
Russell James Hutnik, B.S., Pennsylvania State University; M.S., Yale University
(Forestry) Dissertation: "Accumulation and Production in Red Pine (*Pinus Resinosa Ait.*) Plantations at Various Spacings"
William Thomas Joines, B.S.E.E., North Carolina State College
(Electrical Engineering) Dissertation: "The Characteristic Impedance of Symmetrical Strip Transmission Lines with Undesired Modes Suppressed"
Gordon Jones, B.S., Mississippi State
(Physics) Dissertation: "Submillimeter Wave Spectra of HBr, HCl, and CO"
David E. Kemp, A.B., Duke University
(Psychology) Dissertation: "Personality and Behavior in Psychotherapeutic Relationships: Correlates of a Scale of Therapeutic Effectiveness"
William Grant Kenyon, B.A., Swarthmore College; M.S., Bucknell University
(Chemistry) Dissertation: "Alkylations of Phenylacetic Type Esters and Nitriles and of Certain Phenylhydrazones by Means of Alkali Amides"
Chun Su Kim, Seoul University
(Botany) Dissertation: "Marine Algae of Alacran Reef, Southern Gulf of Mexico"
Taik Yung Kim, B.S., College of Liberal Arts and Scieuces, Seoul National University
(Biochemistry) Dissertation: "The Synthesis and Biological Activity of Uridine-5'-Diphospho-N-Acetyl Hexosamines"
Allen John Koppenhaver, B.S., Lebanon Valley College; M.A., Ohio University
(English) Dissertation: "T. S. Eliot's *Murder In the Cathedral*: A Study"
Granvil Charles Kyker, Jr., B.S., Brown University
(Physics) Dissertation: "Proton Resonances in Intermediate Nuclei"
Chien Ping Lee, B.S., National Taiwan University
(Zoology) Dissertation: "Water Balance in the Zebra Finch, *Taeniopygia Castanotis*"
Elmer F. Litzinger, B.S., Geneva College
(Chemistry) Dissertation: "The Synthesis of Some Indoloquinolizinium Salts"
George Edward McCelvey, III, B.A., Rice University; M.A., University of Houston
(English) Dissertation: "William Godwin's Novels: Theme and Craft"
Philip Eugene Miller, B.S., St. Francis College; M.S., Purdue University
(Chemistry) Dissertation: "Kinetic Studies of the Protodecomposition of Hydrogen Peroxide"
Jon Nelson Moline, A.B., Austin College
(Philosophy) Dissertation: "Ethical Justification and Knowledge"
Ronald Eugene Montgomery, B.S., Waynesburg College
(Chemistry) Dissertation: "The Preparation and Some Properties of Uusymmetrical Diaryiphosphinous Chlorides and Diarylphosphine Oxides"
George Allen Neece, A.B., Rice University
(Chemistry) Dissertation: "A Quantum Statistical Theory of Rare Gas Hydroquinone Clathrates and Classical Statistical Studies of Hard Line Rotators"
Thomas Everett Nichols, Jr., B.S., M.S., North Carolina State
(Economics) Dissertation: "Interregional Competition in the Soybean Crushing Industry with Particular Attention to the Southeast"
Dan W. Olds, A.B., Wabash College
(Physics) Dissertation: "Polarized Phosphorescence of Hexachlorobenzene and Para-Dichiorobenzene Crystals at 77° K"
James William O'Leary, B.S., M.S., Ohio State University
(Botany) Dissertation: "Exudation from Root Systems of Woody Plants"
Edward Milton Opton, Jr., A.B., Yale University
(Psychology) Dissertation: "Electroencephalographic Correlates of Performance Lapses on an Attention Task in Young and Old Men"
Richard Hubbard Petersen, A.B., Dartmouth College; B.D., Duke University
(Religion) Dissertation: "The Treatise of Dionysius Bar Salibhi Against the Jews, a Translation and Commentary"
Denny E. Pilant, A.B., Drury College
(Political Science) Dissertation: "A Peacetime Dilemma: The Legal Status of American Civilians Accompanying the Armed Forces Abroad"
Wilbur Hallam Purcell, Jr., B.S., University of Florida
(Mathematics) Dissertation: "A Calculus-of-Variations Approach to the Eigen-values of a Finite Difference Equation"
John Terrence Reynolds, B.A., Rice University
(Physics) Dissertatiou: "Theoretical Considerations of the Investigation of Nuclear Structure by Inelastic Electron Scattering"
Betty McCarthy Richardson, B.A., Wellesley College
(Physics) Dissertation: "Studies of the Triplet-Singlet Decay Lifetime for Certain Organic Crystals at Low Temperatures"
David Cooke Rorer, B.S., Massachusetts Institute of Technology; M.S., University of Illinois
(Physics) Dissertation: "Thermodynamic Properties of Superconducting and Normal Molybdenum"
John Alexander Salmond, B.A., M.A., University of Otago
(History) Dissertatiou: "Roosevelt's Tree Army: A History of the Civilian Conservation Corps, 1933-1942"
Richard H. Schramm, B.S., Capital University; M.A., Ohio University
(English) Dissertation: "The Image of India in Selected American Literary Periodicals: 1870-1900"

George Adam Schultz, A.B., University of Chicago; M.A., Montana State University
(Zoology) Dissertation: "Taxonomy and Ecology of Some American Terrestrial Isopids (Oniscoidea)"
Gerald Harris Shinn, A.B., B.D., Duke University
(Religion) Dissertation: "The Text and Illuminations of the *D* MS. of the *Sachsenspiegel* in Relation to Their *Weltanschauung* and *Zeitgeist*"
Mary Clyde Singleton, B.S., Women's College, University of North Carolina
(Anatomy) Dissertation: "Distribution of Optic Fibres in the Cat"
Robert McConnell Sitton, A.B., Wake Forest College
(Philosophy) Dissertation: "The Ontological Status of the Work of Art: Three Contemporary Views"
Billy Ray Skelton, B.S., M.S., Clemson College
(Economics) Dissertation: "Industrialization and Unionization in North Carolina and South Carolina"
David Edward Smith, B.A., University of Western Ontario
(Political Science) Dissertation: "Emergency Government in Canada and Australia 1914-1919: A Comparison"
Wallace Snipes, B.S., Wake Forest College
(Physics) Dissertation: "Free Radical and Paramagnetic Ions in Biological Systems"
Donald Paul Snyder, A.B., Wagner Lutheran College
(Philosophy) Dissertation: "Causation, Predication and Modal Logic"
Wilbur Clarence Stewart, B.S.E.E., Duke University
(Electrical Engineering) Dissertation: "Current-Induced Transitions in Thin-Film Superconducting Circuits: An Analysis of Transient Thermal Effects in the Presistatron"
John Edward Thomas, B.A., B.D., M.A., McMaster University
(Philosophy) Dissertation: "Analogy and the Meaningfulness of Religious Utterances"
William West Thomas, B.A., Washington and Lee University; B.D., Yale Divinity School
(Religion) Dissertation: "An Examination of D. C. Macintosh's Religious Epistemology"
Rann Lawton Vaulx, B.S., Southwestern at Memphis
(Chemistry) Dissertation: "Metalation of Benzyl-Type Tertiary Amines and N-Methyl-o-Toluamide with n-Butyllithium. Condensations with Electrophilic Compounds, Cyclizations"
James Hamilton Ware, Jr., B.A., M.A., Baylor University; B.D., Southern Baptist Theological Seminary
(Religion) Dissertation: "The Modern Protestant Quest for the Essence of Christianity Focused in William Adams Brown"
Omri Kenneth Webb, Jr., A.B., The Citadel; B.D., Southeastern Baptist Seminary
(Religion) Dissertation: "The Political Thought of Samuel Rutherford"
Herold David Weiss, B.A., Southern Missionary College, M.A., Seventh-Day Adventist Theological Seminary
(Religion) Dissertation: "Piety in Latin Writers in Early Christian Times"
Robert F. Welsh, A.B., Southwestern at Memphis
(English) Dissertation: "The Printing of the Early Editions of Marlowe's Plays: *Tamburlaine* (1590), *The Massacre at Paris* (1592), *Richard II* (1594), *Dido* (1594), *Doctor Faustus* (1604, 1616), *The Jew of Malta* (1633)"
James Irving Wimsatt, B.A., University of Michigan; M.A., Wayne State University
(English) Dissertation: "Chaucer's *Book of the Duchess* and Its French Background"
Mary Ann Wimsatt, A.B., Stetson University; M.A., Duke University
(English) Dissertation: "The Comic Sense of William Gilmore Simms: A Study of the Humor in His Fiction and Drama"
John Delano Woods, B.S., Lenoir Rhyne College
(Chemistry) Dissertation: "The Crystal Structure of N, N-Diphenylacetamide"
Bruce A. Woodson, B.A., Coe College; M.A.T., Johns Hopkins University
(Biochemistry) Dissertation: "Arginine As a Precursor of Pyrimidines in Strain L. 929 Fibroglasts Infected with Pleuropneumonia-Like Organisms"
Frank Thomas Wooten, III, B.S.E.E., Duke University
(Electrical Engineering) Dissertation: "A Study of Stress in Ferromagnetic Thin Films"
Stanislav Zimic, M.A., University of Miami
(Romance Languages) Dissertation: "Cervantes, Lector de Aquiles Tacio y de Alonso Nunez de Reinoso"

ADVANCED DEGREES CONFERRED SEPTEMBER 1, 1964

MASTER OF ARTS

Robert Pierce Althauser
William Dozier Andress, Jr.
Yalman I. Balta
David Winton Bolen, Jr.
Linda Anne Brookover
Nancy Burton
Jane Elliott Chaney
Fred Davis Chappell
Richard Allen Cox
James Allen Crisp, Jr.
Richard Junior Dozier
John Alan English
Ann Sullivan Gravatt
Raymond Frederic Hafer
Judith Allen Hampton
Elson Thomas Harmon
James Powell Hensley
Paul Fenlon Hughes
Raymond Louis Jensen
Philip Dwight Jones
William David Kenneth Kernaghan
Randal Rich Kincaid, Jr.
Hwa Wen Lai
Jerry Bryan Lincecum

Philip Edward Mancha
Barbara Mary Miller
Joanne Montague
Bettie Opal Moretz
Joan Pierce Newman
Sally Sapp Olson
Hyland Bryant Packard
James Norman Porter, Jr.
William Warren Reinhardt
Theodore Frederick Rochow
Arlyne Naphtali Snyder
Paul Clayton Summitt
Paul Hughes Templet
Albert Blythe Turner
Parma Westbury Tuten
Robert Meredith Watson, Jr.
Rebecca Anne White
Frederick Charles Wilbur
Charles Hill Yarborough

MASTER OF ARTS IN TEACHING

Fred Lawrence Adair
Jonathan Edward Adams, Jr.
George Lynn Albert
Robert Brown Ambrose
Frances Ann Bailey
Beverly Barker
James Frederick Barrett
Sybil Jean Beasley
Hugh Charles Bell
James Voigt Bewick
Joseph Washington Bland
Margaret Day Broussard
Diane Ellen Buckley
Douglas Moore Cairns
William Henry Carr
Bonnie McRae Davis
Richard Raphael Enthwistle
Stanley Etersque
Lewis Turner Farmer
Charles Reid Fortenberry
Barbara Marie Grey
Charles Edwin Grigsby
Heather Adele Hall
Ronald Keith Hampton
Edgar Perry Hicks, Jr.
Donna Elaine Houff
Elizabeth Girault Jones
William Daniel Kelly
Margaret Overton Kelso
Dania Kos
Mary Ann Lea
Robert Brent Linblad
Norman Locksley
Coy Edwin McClintock
Joe Ed Manry
William Davis Owen
Phyllis Ann Peterson
Mary Heineman Pilant
Kathleen Priest
Lamar Cecil Ratcliffe
Betsy Jean Reutter
Linda Kathryn Riley
Jean Slade Rooks
Christine Anita Schillinger
Francis Elizabeth Shelly
Charles Ray Sheppard
Christine Lowenbach Shore
Barbara Whittington Tew
Adolph Edward Tokaz
Robert Amrine Turner
Martha Ellen Walker
Frederick George Wild
Angela Williams
Edward Joseph Wiltrakis
Ann Van de Putte Witten

MASTER OF EDUCATION

Joanne Gail Bretsnyder
Betty Best Britt
Albert Edward Eads, Jr.
Bernard Francis Figlock
Eleanor Allen Harris
Dan Atlas Jones
Janet Elaine Leeb
Richard Cupp McMillan
Mary Ann Musser
Janice Robbins Sedgwick
Barbara Lee Wilburn

MASTER OF SCIENCE

Richard Wilcox Burow
Rudolf Carl Werner Dankwort
Hugh Leslie Gerringer, Jr.
James Wallace Hooker
Jean-Pierre Le Floch
William Keith Owens

DOCTOR OF EDUCATION

Robert Ross Byrd, A.B., M.Ed., University of North Carolina
(Education) Dissertation: "A Synoptic Comparison of Certain Variables Found in Educational Programs in Selected Residential Centers Treating Severely Disturbed Children"

David William Rogers, Sr., B.S., Wake Forest College, M.Ed., Duke University
(Education) Dissertation "A Description of the In-Service Education Program in the City Schools of Lumberton, North Carolina for the 1961-62 School Year"

DOCTOR OF PHILOSOPHY

John Darrell Bashaw, B.S., Iowa State University
(Chemistry) Dissertation: "Experimental Studies of Some Organic Semiconductors"

Rajendra Sahai Bhatnager, B.S., M.S., Agra University
(Biochemistry) Dissertation: "The Effect of Lathyrogens on Collagen Metabolism in Embryonic Chick Bones in Culture"

Stephen Christopher Boone, A.B., Duke University
(Anatomy) Dissertation: "The Site and Synthesis of Lignocertic and Nervonic Acids"

John Strickland Boyer, A.B., Swarthmore College; M.A., University of Wisconsin
(Botany) Dissertation: "Effects of Water Stress on Metabolic Rates of Cotton Plants with Open Stomates"

Jesse Hunchberger Brown, A.B., Elizabethtown College; B.D., Crozer Seminary
(Religion) Dissertation: "The Contribution of William Robertson Smith to Old Testament Scholarship, with Special Emphasis on Higher Criticism"

Bernard Arthur Bulos, B.S., City College of New York
(Biochemistry) Dissertation: "A Study of Glutamic-Alanine Transaminase"

Miles Aubrey Crenshaw, A.B., University of Virginia; M.A., Duke University
(Zoology) Dissertation: "Coccolith Formation by Two Marine Coccolithophorids, Coccolithus Huxleyi and Hymenomonas Sp."

William Hoyt Dantzler, A.B., Princeton University; M.D., Columbia University
(Zoology) Dissertation: "The Role of the Kidneys and Bladder in the Handling of Water and Solutes in the Fresh-Water Turtle, *Pseudemys Scripta*, and the Desert Tortoise, *Gopherus Agassizii*"

Eugene Drozdowski, A.B., Alfred University; M.A., Duke University
(History) "Dissertation: "Edwin M. Stanton, Lincoln's Secretary of War: Toward Victory"

John Reid Hauser, B.S., North Carolina State College
(Electrical Engineering) Dissertation: "A Study of Interactions in Silicon Multi-Junction Devices"

Thomas Sidney Katman, B.S., University of Delaware
(Physics) Dissertation: "Proton-Gamma Angular Correlations in the C^{12} (d,p) C^{13} Reaction at Low Energies"
Robert David Kaylor, A.B., Southwestern at Memphis; B.D., Louisville Presbyterian Seminary
(Religion) Dissertation: "The Ascension Motif in Luke-Acts, the Epistle to the Hebrews, and the Fourth Gospel"
William Francis Keirce, B.M.E., M.A., University of Louisville
(English) Dissertation: "The Place of Samuel Johnson in the History of the Literary Character"
George Henri LaRoi, B.A., Lake Forest College
(Botany) Dissertation: "An Ecological Study of the Boreal Spruce-Fir Forests of the North American Taiga"
John Rodgers Moroney, Jr., A.B., Southern Methodist University
(Economics) Dissertation: "Relative Income Shares in the United States, 1922-1961"
James Carlton Randall, B.S., University of South Carolina; M.S., Emory University
(Chemistry) Dissertation: "I. A. Long-Range Asymmetry Effect on Magnetic Equivalence of Methylene Group Protons, and II. An Investigation of Chemical Shift Behavior of Components in Systems Exhibiting Partial Immiscibility"
Clark Gilbert Reynolds, B.A., University of California
(History) Dissertation: "History and Development of the Fast Carrier Task Forces, 1943-1945"
Prem Parkash Sehgal, B.S., Hindu College; M.S., Gwyer Hall, Delhi University; M.S., Harvard University
(Botany) Dissertation: "Ontogenetic, Physical and Chemical Studies on Urease in *Canavalia Ensiformis*, DC."
Henry Otto Stone, Jr., B.S., Wofford College
(Zoology) Dissertation: "The Effects on Blood Viscosity of Red Cell Size and Shape"
Max Keith Sutton, B.S., University of Arkansas
(English) Dissertation: "Shaping Forces in the Theory and Practice of Victorian Humor"
Michael Daniel True, A.B., University of Oklahoma; M.A., University of Minnesota
(English) Dissertation: "The Social and Literary Criticism of Randolph Bourne: A Study of His Development as a Writer"
Barbara Huberman Weinberg, B.S., City College; M.S., Yale University
(Biochemistry) Dissertation: "Some Studies on the Cell-Virus Relationship in Avian Myeloblastosis"
Charles Talmadge Wellborn, B.A., Baylor University; B.D., Southwestern Baptist Theological Seminary; M.A., Baylor University
(Religion) Dissertation: "Twentieth Century Pilgrimage: Walter Lippmann and the Public Philosophy"
Bruce Richard Wenner, B.A., College of Wooster
(Mathematics) Dissertation: "A Nagata-Type Metric on Infinite-Dimensional Spaces"
John Charles White, A.B., Washington and Lee University
(History) Dissertation: "Pierre Victor Malouet: Administrator and Legislator"
Paul Frederick Wohlford, B.A., Harvard College
(Psychology) Dissertation: "Determinants of Extension of Personal Time"
John Edward Woodham, A.B., Birmingham-Southern
(History) Dissertation: "Hipolito Unanue and the Enlightenment in Peru"

Fellows, Scholars, and Assistants

ANGIER DUKE MEMORIAL FELLOW

Name	*Department*	*Home Address*
Arthur Gordon Darroch B.A., University of Western Ontario	Sociology	Middlesex, England

JAMES B. DUKE FELLOWS

Robert Francis Bergstrom B.S., Loyola University	English	Chicago, Illinois
Robert B. Bickley, Jr. B.A., University of Virginia	English	Anchorage, Kentucky
David Dwight Burr B.A., Oberlin College; B.D., Union Theological Seminary	Religion	Dalton, Massachusetts
Bradley Burton Cox B.S., University of Kentucky	Physics	Lancaster, Kentucky
Charles H. Dickens B.S., Duke University	Education	Thomasville, North Carolina
James David Farthing B.A., Oklahoma Baptist University	History	Shawnee, Oklahoma
Frederick J. Fletcher B.A., University of British Columbia	Political Science	Vancouver, Canada
James Joseph Foster B.A., Johns Hopkins University	English	Baltimore, Maryland

Name	*Department*	*Home Address*
Martha Randolph Foy A.B., Randolph-Macon College; M.A., Yale University	French	Richmond, Virginia
Jack L. Granatstein B.A., Royal Military College; M.A., University of Toronto	History	Ontario, Canada
Donald Larry Hester B.S., North Carolina State College; M.S., University of New Mexico	Electrical Engineering	Stanley, North Carolina
Gary Melvin Hipps A.B., M.A., University of North Carolina; M.A.T., Duke University	Education	Tryon, North Carolina
Edwin Ewell Hopkins A.B., University of Maryland	Philosophy	Baltimore, Maryland
Richard Thomas Johnson B.A., Reed College; M.A., University of British Columbia	English	Vancouver, Canada
William Jonas Jones, Jr. B.S., William and Mary College	Chemistry	Whaleyville, Virginia
William Nolan Kammer A.B., Fordham College	Political Science	New Orleans, Louisiana
William Lawrence Larche B.A., Florida Presbyterian College	German	Gainesville, Florida
Robert William Miller B.A., Western University	Political Science	Walkerton, Canada
Richard Leslie Morrill A.B., Brown University; B.D., Yale University	Religion	Hingham, Massachusetts
Ann Morrow B.A., Gettysburg College	Zoology	Bloomfield, Pennsylvania
Minor Myers, Jr. B.A., Carleton College	Political Science	Akron, Ohio
Rudolph Plehwe B.A., University of Tasmania	Political Science	Tasmania, Australia
George David Richards A.B., Hamilton College	English	Utica, New York
Robert Paul Schultz B.S., Michigan State University; M.S., Oregon State University	Forestry	Lanse, Michigan
David Oliver Sewell B.A., University of Canterbury	Economics	Wellington, New Zealand
Margaret Sue Sullivan A.B., Duke University; M.A., Auburn University	English	Columbus, Georgia
Fulton Robert Wilcox B.A., Norwich University	History	Portland, Maine
John K. Yost B.A., Washington State University; B.D., Harvard University	History	Pullman, Washington

OTTIS GREEN FELLOWS

Rupert Archer Buchanan B.A., Bishops University; LL.B., University of British Columbia	Philosophy	Ontario, Canada
Gary Leroy Maris A.B., Stetson University	Political Science	Melbourne, Florida

GURNEY HARRIS KEARNS FELLOWS IN RELIGION

Daniel Castillo Arichea B.T., Theological Seminary; B.A., Philippine Christian College; M.R.E., Duke University	Religion	Zambales, Philippines
Owen Lennon Norment, Jr. A.B., University of North Carolina; B.D., Th.M., Union Theological Seminary	Religion	Hillsboro, North Carolina
Charles Allen Rogers B.A., Southwestern University; B.D., Perkins Theological Seminary	Religion	San Antonio, Texas

COMMONWEALTH-CENTER FELLOWS

Neal Monroe Adams B.S., University of Vermont; M.A., Wake Forest College	History	Union, New Jersey
George Bryan Breckenridge M.A., University of Glasgow	Political Science	Dumbarton, Scotland
Francois V. Lacasse B.A., B.S.C., M.A., University of Montreal	Economics	Quebec, Canada
Robert Foliet Neill B.A., M.A., University of Toronto; S.T.B., University of St. Michaels	Economics	Saskatchewan, Canada

WOODROW WILSON FELLOWS

John Gordon Agee B.A., University of Utah	History	Ogden, Utah
William Wayne Dickson B.A., Stetson University	English	Miami, Florida
Sandra Wayne Frederick B.A., Duke University	English	Asheville, North Carolina

Name	*Department*	*Home Address*
Joan Holmquist Smith A.B., Duke University	French	Rockford, Illinois
Karen Singer Jabbour A.B., University of Miami	English	Miami, Florida
Deunis Powell Quinby A.B., Western Marylaud College	Economics	Cambridge, Maryland
Michael Vincent Thomason B.A., University of the South	History	West Palm Beach, Florida
Catherine Byrn Ward A.B., University of Kentucky	English	Lexington, Kentucky
Barbara Brown Zikmund B.A., Beloit College; B.D., Duke University	Religion	Durham, North Carolina

DUKE WOODROW WILSON FELLOWS

Martha Sue Berry B.A., Tulane University	Political Science	Brookings, South Dakota
Robert Edward Cormier B.S., University of Maine; M.A., State University of Iowa	English	Bar Harbor, Maine
Bert Dillon B.A., University of Colorado; M.A., Columbia University	English	Lamar, Colorado
Jonathan David Fraley A.B., University of North Carolina	History	Lenoir, North Carolina
Elson Thomas Harmon A.B., Princeton University	English	Eastou, Pennsylvania
Paul Fenlon Hughes B.A., Lamar State College	English	Brownsville, Pennsylvania
Alan Albert Jabbour A.B., University of Miami	English	Jacksonville, Florida
Philip Dwight Joues A.B., University of Cincinnati	History	Wayne, West Virginia
Jerry Bryan Lincecum B.A., A. and M. College of Texas	English	Thornton, Texas
Clayton C. Morgareidge B.A., San Francisco State College	Philosophy	Modesto, California
John Louis Pierce B.A., University of Tennessee	Political Science	Knoxville, Tennessee
Ann Fiser Richman A.B., Memphis State University	English	Memphis, Tennessee
John Evan Simpson A.B., Amherst College	Philosophy	Sacramento, California

WOODROW WILSON DISSERTATION YEAR FELLOW

Richard Michael Kelly B.A., City College of New York	English	Woodside, New York

COKESBURY AWARDS IN COLLEGE TEACHING

Mildred Elizabeth Coulbourn B.A., Converse College	English	Birmingham, Alabama
Norma Taylor Mitchell B.A., College of William and Mary; M.A., Duke University	History	Barbourville, Kentucky

NATIONAL SCIENCE FOUNDATION COOPERATIVE FELLOWS

Claude C. Gravatt, Jr. B.S., University of Richmond	Chemistry	Arlington, Virginia
Elizabeth Lee Klepper B.A., Vanderbilt University; M.A., Duke University	Botany	Memphis, Tennessee
Wayne Lee Mattice B.A., Grinnell College	Biochemistry	Sioux Falls, South Dakota
Roger Lyman Morehouse B.A., Wabash College	Physics	Chatham, New Jersey
Roger Wayne Nelson B.S., University of Rochester	Chemistry	Annapolis, Maryland
Brenda Lamont Pruden B.A., Wellesley College	Physics	South Orange, New Jersey
James R. Sawers, Jr. B.S., Duke University	Physics	Needham, Massachusetts
Louis Edgar Wright B.S., Louisiana State University	Physics	Baker, Louisiana

Name	*Department*	*Home Address*

N.S.F. GRADUATE FELLOWS

John Timothy Anderson A.B., Hamilton College	Mathematics	Northport, New York
William A. Calder, Jr. B.S., University of Georgia; M.S., Washington State University	Zoology	Decatur, Georgia
Nancy Stiles Nickerson A.B., Smith College	Zoology	West Springfield, Massachusetts
Deborah Burnham Printz B.S., Duke University	Biochemistry	Chapel Hill, North Carolina
Fred Howard Rash B.S., Wake Forest College	Chemistry	Lexington, North Carolina
William C. Ward, Jr. A.B., Johns Hopkins University	Psychology	Baltimore, Maryland
Charles P. Weatherspoon B.S., University of Arizona	Forestry	Tucson, Arizona

N.S.F. SUMMER TEACHING ASSISTANTS

James William Berry B.S., East Tennessee State College; M.S., Virginia Polytechnic Institute	Zoology	Abingdon, Virginia
Richard Wesley Rhoades B.S., M.S., University of New Hampshire	Botany	Port Washington, New York

LILLY FOUNDATION FELLOWS AND SCHOLARS

Peter Nelson Crossland B.A., M.A., Miami University; B.D., Yale University	Political Science	Zanesville, Ohio
Joyce M. Huntley B.A., Ohio Wesleyan University; M.A., Duke University	Political Science	Chapel Hill, North Carolina
James Minor Nickell A.B., University of Kentucky; S.T.B., General Theological Seminary	Political Science	Ashland, Kentucky
Charles Joseph Stevens B.A., Ursinus College	Political Science	Burlington, New Jersey
John L. Washburn II A.B., Park College	Political Science	Versailles, Missouri
George Robert Wills B.A., M.A., Duke University	Political Science	Balboa, Canal Zone

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FELLOWS

Martyn Mathews Caldwell B.S., Colorado State University	Botany	Denver, Colorado
Suzanne B. Collings B.S., University of Tennessee	Zoology	Knoxville, Tennessee
Daniel Wayne Deis B.S., Stanford University	Physics	San Jose, California
John Raymond Dillon A.B., Gettysburg College	Zoology	Baltimore, Maryland
Wallace E. Garthright, Jr. B.A., Richmond College	Mathematics	Cherry Hill, New Jersey
Richard Wayne Godwin B.S., Rensselaer Polytechnic Institute	Chemistry	New Orleans, Louisiana
Harold Edmund Hackett B.S., M.S., University of Miami	Botany	Portland, Maine
John Frederick Hansen B.A., Wisconsin State College	Chemistry	Turtle Lake, Wisconsin
Edward M. Hogan B.A., Cornell University	Physics	Arlington, Virginia
Morris Kyger Holland B.A., University of Colorado	Psychology	Boulder, Colorado
John Oscar Kiltinen A.B., North Michigan University	Mathematics	Marquette, Michigan
James Richard Krabill B.A., Miami University	Mathematics	Bowling Green, Ohio
George Lake Morgan B.A., Rice University	Physics	Houston, Texas
William August Sander III B.S., Clemson College	Electrical Engineering	Charleston, South Carolina
David Lee Sellin B.S., California Institute of Technology	Physics	Milwaukee, Wisconsin
John Arthur Stone B.S., Wofford College	Chemistry	Spartanburg, South Carolina
John William Teipel B.A., Rockhurst College	Biochemistry	Kansas City, Missouri

Name	*Department*	*Home Address*
David Michael Waggoner B.S., Duke University	Physiology	Grosse Point, Michigan
Peter Douglas Weigel B.A., Williams College	Zoology	Chappaqua, New York
Donald Bruce Zobel B.S., North Carolina State College	Botany	Raleigh, North Carolina

NATIONAL DEFENSE ACT FELLOWS

Gene Anne Allred B.A., Mary Baldwin College	Philosophy	Fort Smith, Arkansas
George Artman, Jr. A.B., University of Tampa	History	St. Petersburg, Florida
John Wayne Battle A.B., University of Chattanooga	Romance Languages	Signal Mountain, Tennessee
Frank Dawson Bean, Jr. A.B., University of Kentucky	Sociology	Lexington, Kentucky
Kirsten Beck A.B., Bucknell University	Philosophy	Washington, D. C.
Brian Layton Blakeley B.S., Wisconsin State College	History	Eau Claire, Wisconsin
Frederick Joseph Breit B.A., Roosevelt University	History	Chicago, Illinois
Robert J. Cain A.B., Wake Forest College	History	Clinton, North Carolina
Patrick Peter Dunn B.A., Marquette University	History	Cudahy, Wisconsin
Karl C. Garrison, Jr. A.B., University of Georgia; B.D., Episcopal Divinity School	Sociology	Ellensburg, Washington
David Adelbert Gascon A.B., Tufts University	French	Auburndale, Massachusetts
Richard Foster Glenn B.A., Hampden-Sydney College	Romance Languages	Prospect, Virginia
Frederick O. Goddard B.A., University of Florida	Economics	Gainesville, Florida
Roy Neil Graves II A.B., Princeton University	English	Medina, Tennessee
Thomas Joseph Grilliot B.S., University of Dayton	Mathematics	Dayton, Ohio
Juergen Siegfried Hahn B.A., University of Michigan	Romance Languages	Ann Arbor, Michigan
Jerry Allen Herndon B.S., Murray State College	English	Cadiz, Kentucky
George Stewart Jackel B.S.C., Drexel Institute of Technology	Physics	Philadelphia, Pennsylvania
Raymond Louis Jensen B.A., Bemidji State College	History	Perham, Minnesota
Richard W. O. Lethander B.A., Carleton College	Economics	Park Ridge, Illinois
Donald Ray McAdams B.A., Columbia Union College	History	Tacoma Park, Maryland
Marion Vernon Morgan B.S., North Carolina State College	Anatomy	Charlotte, North Carolina
Judith Louise Morganroth A.B., Barnard College	Romance Languages	Yonkers, New York
Paul F. Mulligan, Jr. A.B., St. Peters College	Economics	Kearny, New Jersey
Roger Bain Nelsen B.A., DePauw University	Mathematics	Indianapolis, Indiana
John Preston Pooler A.B., Brown University	Physiology	Weston, Massachusetts
George I. Rand B.A., Trinity College	English	Hicksville, New York
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BULLETIN
OF
DUKE UNIVERSITY



ENGINEERING

THE UNDERGRADUATE COLLEGE
THE GRADUATE PROGRAM

ANNOUNCEMENTS FOR 1965-1966

VOLUME 37 June, 1965 NUMBER 5-A

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ENGINEERING

THE UNDERGRADUATE COLLEGE
THE GRADUATE PROGRAM

ANNOUNCEMENTS FOR 1965-1966

DURHAM, NORTH CAROLINA
June 1965

Calendar of the College

1965

September	17.	Friday, 7:30 p.m. Freshman Week begins: Assemblies for all new students entering the College of Engineering, Trinity College, and the Woman's College.
September	20.	Monday. Registration and matriculation of all students of the College of Engineering, Trinity College, and the Woman's College, who have not pre-registered. Registration of graduate students.
September	22.	Wednesday. Final registration of pre-registered students. All students report to their Dean's Office for class cards.
September	23.	Thursday, 8:10 a.m. Fall semester classes begin.
November	6.	Saturday. Last day for reporting six-weeks grades.
November	15-18.	Pre-registration for Spring Semester, 1966.
November	24.	Wednesday, 12:30 p.m. Thanksgiving recess begins.
November	29.	Monday, 8:10 a.m. Classes are resumed.
December	11.	Saturday. Founders' Day.
December	18.	Saturday, 12:30 p.m. Christmas recess begins.

1966

January	3.	Monday, 8:10 a.m. Classes are resumed.
January	15.	Saturday, 12:30 p.m. Fall semester classes end.
January	18.	Tuesday. Final examinations begin.
January	28.	Friday. Final examinations end.
February	1.	Tuesday. Registration and matriculation of new undergraduate students.
February	2.	Wednesday. Last day for matriculation for the spring semester. All students report to their Dean's Office for class cards. Registration of graduate students.
February	3.	Thursday, 8:10 a.m. Spring semester classes begin.
March	16.	Wednesday. Last day for reporting six-weeks grades.
March	21-24.	Pre-registration for Summer Session and for Fall Semester.
March	26.	Saturday, 12:30 p.m. Spring recess begins.
April	4.	Monday, 8:10 a.m. Classes are resumed.
May	19.	Thursday, 5:00 p.m. Spring semester classes end.
May	21.	Saturday. Final examinations begin.
June	1.	Wednesday. Final examinations end.
June	4.	Saturday. Commencement begins.
June	5.	Sunday. Commencement Sermon.
June	6.	Monday. Graduating Exercises.

For complete calendar of THE GRADUATE SCHOOL, refer to *Bulletin of the Graduate School of Arts and Sciences.*

Contents

PAGE

Calendar of the College 2
Officers of the College 4
  Administration 4
Engineering Programs 6
Admission 9
  Undergraduate 9
  Graduate 11
Department of Civil Engineering 13
  Faculty and Facilities 13
  Undergraduate Curriculum and Courses 16
  Graduate Program 18
  Graduate Courses of Instruction 19
Department of Electrical Engineering 22
  Faculty and Facilities 22
  Undergraduate Curriculum and Courses 26
  Graduate Program 29
  Graduate Courses of Instruction 29
Department of Mechanical Engineering 32
  Faculty and Facilities 32
  Undergraduate Curriculum and Courses 35
  Graduate Program 38
  Graduate Courses of Instruction 38
Subjects Common to All Curricula 40
Reserve Officers Training Corps 44
Financial Information, Living and Dining Accommodations 45
The Counseling Center 51
Employment Opportunities 52
Registration and Academic Regulations 53
  Undergraduate 53
  Graduate 57
Honors, Prizes, Activities 63
Supporting Staff 66
  Faculty Emeritus 66
  Research 67
  Fellows 67
  Clerical and Technical 67
Engineering Faculty Council 67
Faculty Committees 68
Index 69

Officers of the College

General University Administration

Douglas Maitland Knight, Ph.D., LL.D., Litt.D., *President of the University*

Robert Taylor Cole, Ph.D., *Provost*

Gerhard Chester Henricksen, M.A., C.P.A., *Vice President for Business and Finance, and Treasurer*

Everett Harold Hopkins, LL.D., *Vice President for Planning and Institutional Studies, and Assistant Provost*

Frank Leon Ashmore, A.B., *Vice President for Institutional Advancement, and Assistant Provost*

Charles Edward Jordan, A.B., LL.D., *Vice President for University Relations*

Frank Traver de Vyver, Ph.D., *Vice Provost*

Harold Walter Lewis, Ph.D., *Dean of Arts and Sciences, and Vice Provost*

Maurice Barnes Woodhall, M.D., *Vice Provost*

Benjamin Edward Powell, Ph.D., *Librarian*

Richard Lovejoy Tuthill, Ed.D., *University Registrar*

Craufurd David Goodwin, Ph.D., *Secretary*

Edwin Constant Bryson, LL.B., *University Counsel*

Engineering Administration

†James Lathrop Meriam, Ph.D., *Dean and Director of Research and Development*

*Charles Rowe Vail, Ph.D., *Associate Dean for Graduate Study and Research*

Edward Kready Kraybill, M.S.E., *Assistant Dean of Engineering*

Richard Lionel Predmore, D.M.L., *Dean of The Gradnate School of Arts and Sciences*

Robert B. Cox, A.M., *Dean of Undergraduate Men*

Everett Broadus Weatherspoon, A.B., *Director of Admissions, College of Engineering and Trinity College*

Earl Ivan Brown, II, Ph.D., *Chairman and Director of Undergraduate and Graduate Studies, Department of Civil Engineering*

Thomas George Wilson, Sc.D., *Chairman, Department of Electrical Engineering*

Otto Meier, Jr., Ph.D., *Director of Undergraduate Studies, Department of Electrical Engineering*

Harry Ashton Owen, Jr., Ph.D., *Director of Graduate Studies, Department of Electrical Engineering*

Van Leslie Kenyon, Jr., M.M.E., *Acting Chairman and Director of Undergraduate and Graduate Studies, Department of Mechanical Engineering*

Mrs. Dorothy Holt McElduff, A.B., *Recorder*

Faculty

Faculty members are listed at the beginning of their respective departmental sections and in the Index.

* Acting Dean, Spring Semester, 1964-65.
† Absent on leave, Spring Semester, 1964-65.

The Profession of Engineering

ENGINEERING has been defined as the profession in which a knowledge of mathematics and the natural sciences is applied to develop ways of utilizing economically the materials and forces of nature for the well-being of mankind. While, as a *science,* it involves mathematics and the natural sciences, as an *art,* it involves human imagination and judgment. It is interdisciplinary, and it invokes both the processes of analysis and creative synthesis. The engineer works at the level of principles and concepts, and he seeks to achieve an optimum combination of basic concepts to yield imaginative new solutions to problems.

Engineering has, throughout history, continually interacted with the rest of human society in a highly determinative way. Its influence is evident in the very fabric of our culture. Engineering has provided the means for feeding, clothing, and sheltering mankind. It has largely freed men's bodies from physical drudgery and their minds from the slavery of routine mental effort. It has provided the tools of new scientific discovery, as well as those of new art forms. It has provided the means for bringing to mankind everywhere the results of the creative efforts of the great artists, writers, scientists, and philosophers of both ancient and modern times. It has placed man in close contact with his fellowmen throughout the world, and is now about to place man on the moon. The modern engineer must be broad, as well as deep, in his knowledge and interests, and his education must reflect this fact.

Engineering at Duke

THE programs of engineering education and research at Duke University are designed to provide the opportunity for students to prepare for successful practice of that profession, for continuing personal cultural development, and for a satisfying and responsible citizenship.

The College of Engineering offers fully-accredited curricula leading to the degree of Bachelor of Science in Civil, Electrical, or Mechanical Engineering (B.S. in C.E., EE., or M.E.). Through the Graduate School of Arts and Sciences it also offers work leading to the degree of Master of Science (M.S.) in civil, electrical, or mechanical engineering, and to the Doctor of Philosophy (Ph.D.) degree in civil or electrical engineering.

History

The College of Engineering traces its origin to 1887, when instruction in engineering subjects was begun by Trinity College. With the establishment of Duke University the program in engineering rapidly evolved to its present status through a series of steps that included the formation of separate departments in civil and electrical engineering in 1927, the formation of a separate department in mechanical engineering in 1931, the establishment of the Division of Engineering, with the three departments as components, in 1937 and, finally, the incorporation of this Division into the University structure in 1939 as the College of Engineering, one of the three coordinate undergraduate colleges of Duke University. The Master of Science degree with a major in engineering was authorized in 1956 and the Doctor of Philosophy was authorized in electrical engineering in 1960, and in civil engineering in 1964, both through the Graduate School of Arts and Sciences.

Relationship to the University

As part of the University community, students in the engineering programs share in a total educational experience that only a major university can provide. The College of Engineering shares the same campus with Trinity College, the Graduate School of Arts and Sciences, the Divinity School, and the Schools of Forestry, Law, Medicine,

and Nursing. The facilities for library, laboratory, and field work and the many activities—religious, intellectual, cultural, pre-professional, social, and athletic—form a major part of the environment of the engineering student. He may enjoy simultaneously the broad facilities and challenges of a university and the life and atmosphere of a small college.

Undergraduate Program

The aim of undergraduate engineering education at Duke is to provide an atmosphere in which the student will be motivated to acquire knowledge and understanding in various areas of human endeavor and to equip him for an effective and satisfying career in his chosen profession. The program stresses the development of intellectual power and seeks to provide a broad scientific base for later technical studies as well as to stimulate an interest in the humanities and the social studies. Both on the campus and in the classroom the emphasis is on the individual. To this end classes are kept small and close contact is maintained between professor and student.

Details concerning curricula and course offerings are presented under the departmental headings later in this *Bulletin*.

Detailed information of particular interest to prospective students can be found in the bulletin *Information for Prospective Students,* which is available through the Registrar, Duke University, Durham, North Carolina, 27706.

Master of Science Program

Through the Graduate School of Arts and Sciences, the three departments which constitute the College of Engineering offer work leading to the Master of Science degree with a major in civil, electrical, or mechanical engineering. Each of these programs requires 30 units of graduate work: 24 units of course work and a research-based thesis carrying 6 units of credit. The available areas of specialization in each department are listed elsewhere in the appropriate departmental section of this *Bulletin*.

For further information, write to the Associate Dean for Graduate Study and Research, College of Engineering, Duke University, Durham, N. C., 27706.

Doctor of Philosophy Program

The Doctor of Philosophy degree with a major in civil or electrical engineering is offered through the Graduate School of Arts and

Sciences. Minimum requirements for this degree include 48 units of graduate course work, a reading knowledge of two foreign languages, and a research-based dissertation. The available areas of specialization are listed in this *Bulletin* in the sections on civil or electrical engineering.

For further information, write to the Associate Dean for Graduate Study and Research, College of Engineering, Duke University, Durham, N. C., 27706.

Organization

The affairs of the College of Engineering are administered by the Dean of the College, with the assistance of an Executive Committee which includes the Associate and Assistant Deans and the Chairmen of the three Departments of Engineering. The legislative body of the College is the Engineering Faculty Council, which has responsibility for the curriculum and for determining policies in those academic matters that pertain exclusively to the College of Engineering. The affairs of each department of engineering are administered by the Chairman of that Department, with the assistance of the Department Faculty. Much of the administrative work of the College is carried out with the assistance of faculty committees.

The graduate programs are administered by the respective engineering departments under the coordination of the Associate Dean for Graduate Study and Research and through the Graduate School of Arts and Sciences.

Physical Plant

The entire College is in a single building on the West Campus. It was first occupied in January 1948. Each of three wings houses the instructional and research laboratories and the special classrooms of one of the three engineering departments. The main portion of the building has offices, classrooms, and other general facilities including a library of some 34,000 volumes and 425 periodicals; an auditorium where audio-visual instruction can be given to large groups; conference rooms and seminar rooms; a student lounge; design rooms; facilities for reproducing copy of various types; a central precision shop; and central, as well as departmental, analog computation facilities.

Admission

Undergraduate

CANDIDATES may qualify for admission to the College of Engineering as members of the freshman class or as students with advanced standing. Since the enrollment is limited, the Committee on Admissions selects students who, in its judgment, are best qualified to benefit from the opportunities which the College offers. Selection is based primarily on the academic record of the candidate, on test scores, and on satisfactory evidence of good character and general fitness for college life at Duke. A personal interview with an officer of the Admissions Office is welcomed, and a visit to the campus is of material benefit to the candidate.

ADMISSION TO THE FRESHMAN CLASS: A candidate for admission to the freshman class must present at least 15 acceptable units of secondary school credit. A minimum of 12 units in college preparatory subjects must be presented, but it is recommended that 15 be offered. Subjects classified as college preparatory are English, foreign languages, history and social studies, mathematics and sciences. Candidates are advised to present four units of mathematics and at least one unit in physics or chemistry.

All candidates for admission to the freshman class are required to take the Scholastic Aptitude Test and three Achievement Tests of the College Entrance Examination Board (CEEB). The Achievement Tests must include the English Composition Test and the appropriate test in mathematics. Details of the procedure to be followed in complying with this requirement will be sent to each candidate for admission.

ADMISSION PROCEDURE: Application for admission to the College of Engineering should be made to the Office of Admissions, Duke University, Durham, North Carolina, 27706. Application forms and instructions will be sent to the candidate. It is the responsibility of the candidate to see that these forms are properly executed and, together with other requested material, sent promptly to the Office of Admissions. A nonrefundable application processing fee of $10.00 must accompany the official application form.

EARLY DECISION PLAN: For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on December 1 of the stu-

dent's senior year in secondary school. The deadline date for completing applications for Early Decision is November 1. Interested students should write to the Office of Admissions for detailed information.

REGULAR ADMISSION: Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group, decisions are mailed by April 15.

Application forms and instructions regarding procedure and necessary documents to be included will be sent upon request to the Office of Admissions, Duke University, Durham, North Carolina, 27706.

ADMISSION TO ADVANCED STANDING: Admission by transfer from other institutions may be arranged for a limited number of students, under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal, and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students may not apply for transfer beyond admission to the junior class.

Credit for work completed at other institutions will be determined in relation to the curriculum requirements of the College of Engineering, and must be approved by the appropriate Director of Undergraduate Studies and the Dean of Engineering. Prior approval should be obtained before scheduling courses for transfer credit to be taken at other institutions. Courses in which grades of less than C have been earned are not acceptable for transfer credit.

The maximum amount of credit acceptable from a junior college is 60 semester hours, exclusive of physical education. No credit is given for work completed by correspondence, and credit for no more than six semester hours is allowed for extension courses. Any extension work accepted must be specifically approved by the Dean of the College.

ADVANCED PLACEMENT: The College has arranged for course placement on the basis of good performance on either the Advanced Placement Examinations of the CEEB or—to a more limited extent—on placement tests given during Freshman Week. The College Board Advanced Placement Examinations are a vehicle to sophomore-level or higher placement in botany, chemistry, English, French, German, history, Latin, mathematics, physics, Spanish, and zoology, while the Duke tests are used to decide such placement only in foreign languages and mathematics. A further distinction is that only the AP Examinations may lead to credit toward graduation for the course or courses omitted. The departmental directors of undergraduate study

and the Registrar are charged with the responsibility for evaluations leading to advanced placement of freshman matriculants.

Advanced Placement Examinations are given in May by the College Entrance Examination Board. Information regarding the tests may be obtained from the Board.

ADVANCED PLACEMENT COURSE CREDIT: Any student who has earned a score of 3 or higher on an Advanced Placement Examination of the CEEB and is approved for placement in a sophomore-level course or above may be considered for course credit in appropriate subjects. For those presenting scores of 4 or 5 the award of credit will be made automatically upon matriculation; for those presenting scores of 3 it will be determined with the approval of the University department concerned, no earlier than the end of the first semester. Course credit may be granted for one or two semesters in each subject area in which examination is offered in the Advanced Placement Program. In the case of Engineering 1 and Engineering 2, for which CEEB tests are not given, credit may be given on the basis of qualifying tests.

ADMISSION OF SPECIAL STUDENTS: Students of mature age may be admitted for special work in such courses of instruction as they are qualified to take. They may not be admitted as candidates for a degree in a regular course unless they meet all normal requirements for admission.

READMISSION OF FORMER STUDENTS: A student who, following withdrawal from the College, desires to return should apply to the Director of Admissions, and send a detailed statement of his activities since leaving Duke University.

WOMEN STUDENTS: Women students enrolled in the College of Engineering live on the Woman's College campus and are subject to the general non-academic regulations of the Woman's College.

Graduate

PREREQUISITES: A student seeking admission to the Graduate School of Arts and Sciences of Duke University with a major in engineering must normally have received a Bachelor's degree from an accredited engineering institution. His undergraduate program should be well rounded and of such quality as to give positive evidence of capacity for graduate study.

STUDENTS REQUIRING ADMISSION: Admission is required of (1) all students who intend to pursue study toward a degree offered by the Graduate School, (2) all other students who desire credit for whatever purpose for graduate courses—except students who register only in the Summer Session. Students who have discontinued a pro-

gram of study after earning a master's degree here must by letter request permission of the Dean of the Graduate School to undertake a doctoral program.

PROCEDURE FOR ALL APPLICANTS: A student seeking admission to the Graduate School should request the Dean of the Graduate School to send an application blank. This he should fill out completely and return promptly. In addition he should provide the following supporting documents: (1) a transcript or transcripts of all his undergraduate and graduate work mailed directly by the Registrar to the Dean; (2) as soon as possible, supplementary transcripts showing completion of work in progress when the earlier transcript was made; (3) three letters of recommendation written by persons best qualified to judge him as a prospective graduate student and mailed directly to the Dean; (4) scores on the Graduate Record Examination and Miller Analogies Test (recommended for all applicants and required of applicants for fellowships).

For complete admission requirements, consult the *Bulletin of the Graduate School of Arts and Sciences,* which may be obtained by writing to the Dean, Graduate School of Arts and Sciences, Duke University, Durham, North Carolina, 27706.

Uniform Freshmen Year

To provide the beginning engineering student with the necessary background in fundamentals upon which a variety of engineering programs of study can be based, and to relieve him of the necessity of committing himself immediately to a specific major branch of engineering, a common core of courses is provided for all freshmen. These courses are listed below.

All engineering curricula are undergoing thorough restudy and re-evaluation, hence final description of proposed courses beyond the freshman year are not yet fully available.

Freshman Year

FIRST SEMESTER			S.H.	SECOND SEMESTER			S.H.
Chem	1	Gen. Inorg. Chemistry	4	Chem	2	Gen. Inorg. Chemistry	4
Engrg	1	Engineering Design I	2	Engrg	2	Engineering Design II	2
Engl	1	English Composition	3	Engl	2	English Composition	3
*Hist	1	Modern History	3	*Hist	2	Modern History	3
Math	21	Introductory Calculus	3	†Math	22	Introductory Calculus	3
PE		Physical Education	1	PE		Physical Education	1
			16				**16

* A small group of freshmen will be invited to enroll in a pilot section of a new course in place of history.

† Courses which must be passed before engineering academic standing can be advanced. (See page 54.)

** Freshman engineering students taking Air Science or Naval Science should schedule certain courses in addition to the 16 semester hours prescribed.

Department of Civil Engineering

Chairman and Director of Graduate and Undergraduate Studies:
Earl Ivan Brown, II

Professors

¶Earl Ivan Brown, II (1960)
J. A. Jones Professor
Ph.D. (Texas)

¶Edward Henry Bryan (1960)
Ph.D. (Wisconsin)

¶Aleksandar Sedmak Vesić (1964)
D.Sc. (Belgrade)

*James Wesley Williams (1937)
M.S. (Harvard)

Associate Professors

†Howard N. Haines (1943)
B.S. in Arch. (Minnesota)

¶Aubrey Edwin Palmer (1944)
C.E. (Virginia)

Sudhir Kumar (1958)
Visiting, Part Time
Ph.D. (Pennsylvania State)

Assistant Professors

¶K. Pete Arges (1953)
M.S. in C.E. (Tennessee)

¶David William Hill (1962)
Assistant Professor of Engineering Mechanics
Ph.D. (Stanford)

Furman Wyche Barton (1964)
Ph.D. (Illinois)

Clyde Nelson Holland (1957)
M.S. (Duke)

Paul Harrawood (1956)
M.S. in C.E. (Missouri at Rolla)

Don James Wood (1962)
Ph.D. (Carnegie Tech)

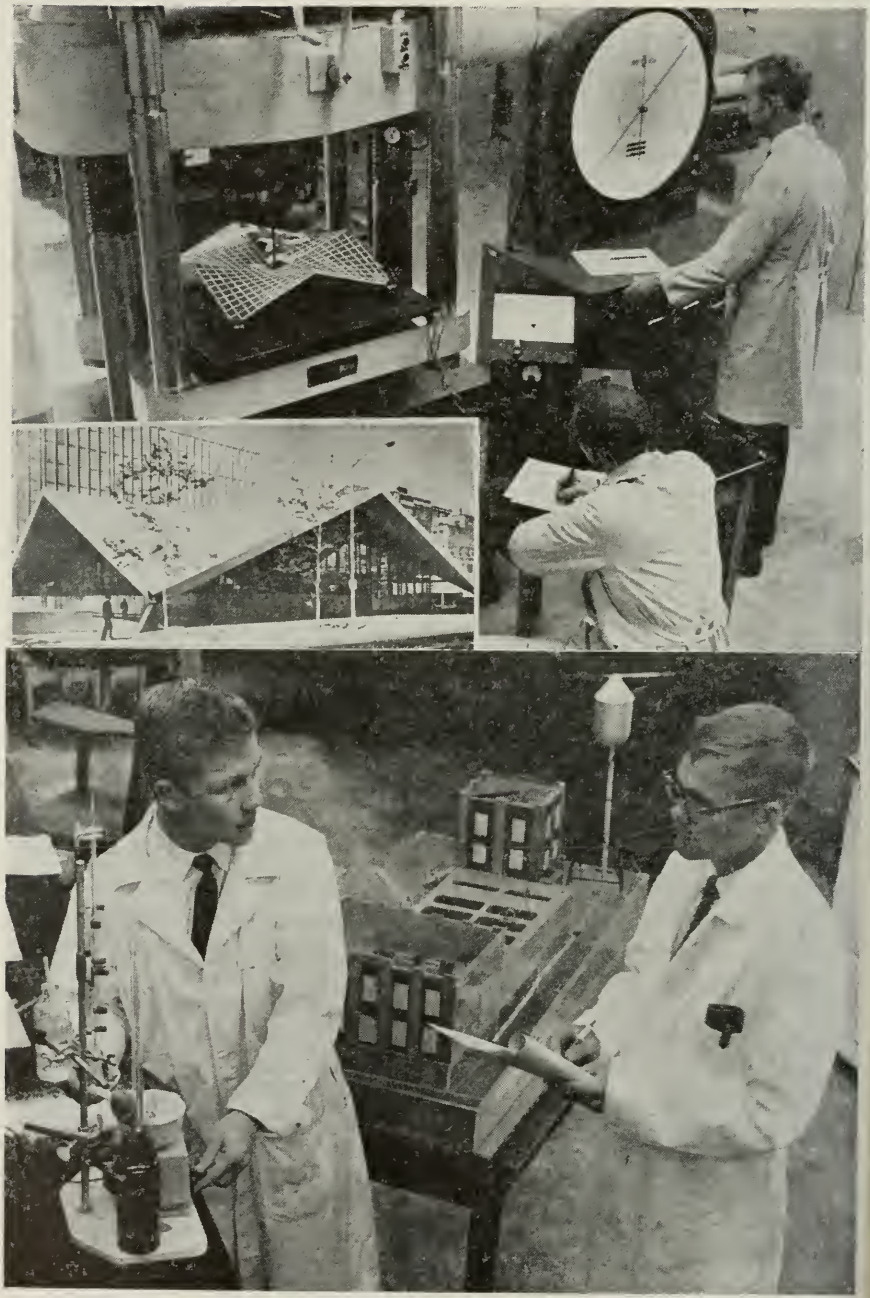
Instructor

¶Frederick Gayle Sheppard (1962)
B.S. in C.E. (Duke)

ALTHOUGH the scope of the civil engineering profession is very broad, its work may be classified into five major fields: *hydraulics*—flood control, river and harbor improvements, irrigation, drainage, and water power; *land utilization*—development of communities, industrial sites, and existing cities; *sanitary engineering*—public health, water supply, and waste disposal; *structures*—bridges, buildings, foundations, dams, tunnels, tanks, thin shells, and missile structures; *transportation*—railroads, highways, airports, waterways, pipelines, and traffic control.

The concern of the civil engineer is primarily with conception, design, and construction, although his responsibility often includes management and maintenance. His undergraduate education com-

¶ Registered Professional Engineer.
† Registered Architect.
* Leave of Absence, Academic Year, 1964-65.



prises scientific, technical, civic, and cultural subjects. In order that he may become qualified to assume responsible charge of engineering work, he must supplement this instruction with progressive study after he graduates and while he is securing his practical experience.

The various facilities of the department are described below.

The *Mechanics of Materials Laboratory* is equipped to give instruction in the basic principles of stress and strain and for the testing of structural members. Its facilities are adequate for both graduate and undergraduate instruction. Included in this laboratory are three universal testing machines with capacities from 5,000 to 400,000 pounds; various hardness testers; machines for testing torsion, fatigue, and impact; calibration apparatus; and a variety of modern strain gages of direct acting mechanical and electric-resistance types.

The Materials Laboratory has the equipment necessary for both engineering research and undergraduate instruction in the physical properties and stress-deformation characteristics of bituminous mixtures, concretes, and soils.

For advanced instruction in *Stress Analysis* there are various polariscopes with facilities for taking and developing pictures, large-sized Begg's deformeter, loading frames, and miscellaneous tools for preparing accurate models for testing. Modern electrical and mechanical instrumentation is available for strain measurements.

The department has an unusually modern and representative collection of *Surveying Equipment:* transits, levels, plane tables, accessory equipment, precise levels and theodolites.

In the *Sanitary Engineering Laboratory* there is complete equipment for performing the physical, chemical, bacteriological, and microscopic tests as outlined by the American Public Health Association.

For *Digital Computer Programming,* departmental card punch equipment using the ALGOL and FORTRAN languages is available.

Program of Studies for the Degree of Bachelor of Science in Civil Engineering

This program is for students who matriculated prior to September 1965; students admitted after that date enter the freshman program outlined on page 12.

All engineering curricula are undergoing thorough restudy and re-evaluation, hence the program which follows is subject to modification beginning with the academic year 1965-66.

Sophomore Year

FIRST SEMESTER			S.H.
†CE	61	Surveying	5
Engrg	57	Statics	3
Math	63	Intermediate Calculus	3
Phys	41	General Physics	4
‡Approved Elective			3
PE		Physical Education	1
			19

SECOND SEMESTER			S.H.
CE	72	Materials Laboratory	1
†Engrg	107	Mechanics of Materials	3
Engrg	109	Mech. of Materials Lab	1
Engl	93	Technical Communication	3
Math	64	Intermediate Calculus	3
Phys	42	General Physics	4
‡Approved Elective			3
PE		Physical Education	1
			19

Junior Year

FIRST SEMESTER			S.H.
CE	118	Engrg. Materials	2
†CE	131	Structural Mech. I	3
Engrg	115	Dynamics	3
Engrg	128	Fluid Mechanics	3
ME	103	Thermodynamics	3
ME	116	ME Laboratory	1
‡Approved Elective			3
			18

SECOND SEMESTER			S.H.
CE	113	Route Surveying	2
†CE	123	Hydraulic Engrg	3
CE	133	Reinforced Concrete	3
EE	123	EE Fundamentals	3
EE	125	EE Fundamentals Lab	1
‡Approved Electives			6
			18

Senior Year

FIRST SEMESTER			S.H.
CE	101	Soil Mech. Lab	1
CE	124	Sanitary Engrg	3
CE	132	Structural Design	4
CE	135	Soil Mechanics	2
CE	146	Professional Engrg	2
‡Approved Electives			6
			18

SECOND SEMESTER			S.H.
CE	116	Transportation	3
CE	140	Structural Mechanics II	3
CE		Elective	3
‡Approved Electives			9
			18

† Courses which must be passed before engineering academic standing can be advanced. (See page 54.)

‡ Part of a program of 30 semester hours of electives planned with departmental approval to suit the interests and abilities of each student. The program will include three semester hours of mathematics beyond calculus; an additional nine semester hours in mathematics, the sciences, or other technical subjects; and another 15 semester hours in the humanities or the social sciences, including six semester hours of either economics or political science.

A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering. All other credits earned in Air Science or Naval Science are taken in addition to the minimum program.

Undergraduate Courses

CE 61. PLANE SURVEYING.—Use and adjustment of instruments; transit-tape, stadia, and plane table surveying; differential and profile leveling; calculation of bearings, latitudes, departures, and areas; accuracy and errors; topographic mapping; rural and urban land surveys; celestial observations for azimuth; triangulation; introduction to photogrammetry. Prerequisites: Engrg. 1 and Math 21. 5 s.h.
Sheppard

CE 72. MATERIALS LABORATORY.—Blending of granular materials and determination of their physical properties, design of concrete and bituminous mixtures, consistency limits of soils. 1 s.h. Holland

CE 101. SOIL MECHANICS LABORATORY.—Soil exploration and sampling. Laboratory determination of index properties: water content, void ratio, particle size, Atterberg limits. Consolidation testing. Triaxial shear testing. Classification and identification of soils. Compaction testing. Demonstrations of seepage, bearing capacity and earth pressure phenomena. Concurrent: CE 135. 1 s.h.
Holland and Vesić

CE 110. *PLANE SURVEYING.—Use and adjustment of instruments; transit-tape, stadia, and plane table surveying; differential and profile leveling; calculation of bearings, latitudes, departures, and areas; accuracy and errors. Prerequisites: Engrg. 1 and Math 21. 3 s.h. Arges

CE 113. ROUTE SURVEYING.—Simple, compound and reverse curves; spirals; earthwork and grading plans. Prerequisite: CE 61. 2 s.h. Sheppard

CE 116. TRANSPORTATION ENGINEERING.—Location, design, construction and maintenance of highways and city streets; soil stabilization; traffic studies; economics of planning and design. Prerequisite: CE 113 and 135. 3 s.h.
Holland

CE 118. MATERIALS OF ENGINEERING.—Behavior of materials under load; mechanical properties as criteria for failure; elementary metallurgy. Ferrous and non-ferrous metals and non-metalic materials. Prerequisites: Engrg. 107 and 109 2 s.h. Pearsall

CE 121. *HYDROLOGY.—Fundamentals of meteorology; precipitation; evaporation. Ground water development. Stream flow and stream gaging. Hydrograph analysis. Flood routing. Field trips to be arranged. Prerequisite: Engrg. 128. 3 s.h. Williams

CE 123. HYDRAULIC ENGINEERING.—Pipe flow, compound pipe systems, network analysis, analysis and problems on pumps and turbines, fundamental aspects of hydrology. Open channel flow, non-uniform flow computations. Irrigation and drainage problems. Flood control and hydraulic structures. Prerequisite: Engrg. 128. 3 s.h. Harrawood

CE 124. FUNDAMENTALS OF SANITARY ENGINEERING.—Engineering and public health aspects of water treatment and supply, waste treatment and disposal, and environmental sanitation. Design basis for collection and treatment facilities. Laboratory procedures and interpretation of results. Prerequisites: Chemistry 2 and CE 123. 3 s.h. Bryan

CE 126. *SANITARY ENGINEERING DESIGN.—Design of facilities for providing an adequate supply of water and means for treatment and disposal of wastes. Stream sanitation as it affects location and design of treatment works. Prerequisite: CE 124. 3 s.h. Bryan

CE 131. STRUCTURAL MECHANICS I.—Shears, moments, and internal forces by algebraic and graphic methods under various conditions of loading. Deflection of trusses. Prerequisite: Engrg. 107. 3 s.h. Brown

* Offered only upon sufficient demand; enrollment limited.

CE 132. STRUCTURAL DESIGN.—Tension, compression, flexural members, eccentric connections, unsymmetrical bending, riveted and welded plate girders, trusses and office building frames. Timber design using ring connectors. Design and detail drawings. Prerequisite: CE 131. 4 s.h. PALMER

CE 133. REINFORCED CONCRETE.—Theory and design of reinforced concrete beams, columns and footings. Moment distribution. Prerequisite: CE 131. 3 s.h. PALMER

CE 135. INTRODUCTION TO SOIL MECHANICS.—Origin and composition of soils, soil structure. Flow of water through soils, capillary and osmotic phenomena. Soil behavior under stress; compressibility, shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes. Prerequisites: Engrg. 107, 109, and 128; concurrent: CE 101. 2 s.h. VESIĆ

CE 140. STRUCTURAL MECHANICS II.—Analysis of statically indeterminate structures by various methods including those of elastic energy. Prerequisite: CE 131. 3 s.h. BARTON

CE 143, 144. *PROJECTS IN CIVIL ENGINEERING.—This course may be assigned by the Chairman of the Department to certain seniors who have shown an aptitude for research, in which case it may be substituted for certain civil engineering courses. 3-6 s.h. STAFF

CE 146. PROFESSIONAL ENGINEERING.—Topics related to the practice of civil engineering: engineering economy, contracts, specifications, and ethics. Presentation of student papers on historical and current aspects of civil engineering. Seniors only. 2 s.h. PALMER

CE 148. *STRUCTURAL ENGINEERING.—Structural design utilizing metals, concrete and timber. Planning, preliminary design, organization of design procedures and specifications. Prerequisites: CE 132 and CE 133. 3 s.h. PALMER

CE 154. *GEOMETRIC THOROUGHFARE DESIGN.—Analysis and design of municipal street systems. Origin-destination surveys; control of traffic flow; grade, rotary, and grade-separation intersections. Prerequisite: CE 113. 3 s.h. WILLIAMS

Programs of Study in Civil Engineering for the Degrees of Master of Science and Doctor of Philosophy

Through the Graduate School of Arts and Sciences, the Department of Civil Engineering offers programs of study and research leading to the degrees of Master of Science and Doctor of Philosophy. These programs are designed to provide a fundamental understanding of the science of engineering, which is based on mathematics and the physical sciences, as well as a basic understanding of the art of engineering which depends on human imagination and judgment.

A student may specialize in one of the following fields of study for either the M.S. or the Ph.D. degree with a major in Civil Engineering: engineering mechanics, hydraulic engineering, materials science, sanitary engineering, soil and foundation engineering, or structural engineering. Appropriate combinations of these fields are also en-

* Offered only upon sufficient demand; enrollment limited.

couraged. Each graduate student participates in seminars appropriate to this field of study.

Under the Reciprocal Agreement with the Consolidated University of North Carolina, a student may include as a portion of the minimum requirements work offered by the Department of Environmental Sciences and Engineering of the University of North Carolina. Although minor work normally is taken in the natural sciences or mathematics, a student whose major interest relates to the social sciences may take relevant minor work in this area.

A *minimum* of 30 units of earned graduate credit beyond the Bachelor's degree is required for the M.S. degree: 12 in engineering, 6 in related minor work (normally mathematics or natural science), 6 in either the major or minor subject or in other areas approved by the major department and the Dean of the College of Engineering, and 6 for a research-based thesis. There is no language requirement for this degree.

A *minimum* of 60 units of earned graduate credit beyond the Bachelor's degree is required for the Ph.D. degree: 24 in engineering, 12 in related minor work (normally mathematics or natural science), 12 in either the major or minor subject or other areas approved by the major department and the Dean of the College of Engineering, and 12 for a research-based dissertation. In addition, a reading knowledge of two foreign languages which are relevant to the field of the dissertation is required (normally two of the following: French, German, or Russian).

A minimum prerequisite to the graduate program in civil engineering is a basic knowledge of mathematics through linear differential equations, materials science, solid mechanics, and fluid mechanics.

Graduate Courses

PROFESSOR BROWN, CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES; PROFESSORS BRYAN, MERIAM, AND VESIĆ; VISITING ASSOCIATE PROFESSOR KUMAR; ASSISTANT PROFESSORS BARTON, HARRAWOOD, HILL, AND WOOD

CE 201. ADVANCED MECHANICS OF MATERIALS.—Analysis of structural elements described by ordinary differential equations, such as beams on an elastic foundation, curved beams, beam-columns, circular plates; introduction to plates and shells; energy principles and their use in structural analysis. 3 units. HILL

CE 202. EXPERIMENTAL STRESS ANALYSIS.—The experimental analysis of stress and strain in deformable bodies. correlation of theory with data from experiments; photoelasticity; strain gauges; dimensional analysis and similitude principles of models. 3 units. HILL

CE 205. APPLIED ELASTICITY.—Introduction to linear theory of elasticity; solutions of two-dimensional problems; three-dimensional problems of torsion and bending; stress concentrations; energy and variational principles with applications to design. 3 units. MERIAM

CE 211. MECHANICAL BEHAVIOR OF MATERIALS.—Macroscopic mechanical properties of materials for static, fatigue, dynamic and creep conditions; impact, shock, and stress wave properties; temperature, creep, viscoelastic and relaxation properties. 3 units. KUMAR

CE 212. STRUCTURAL MATERIALS.—Elasticity and plasticity as related to rheology; natural and synthetic materials; reinforced materials; composites. 3 units. KUMAR

CE 221. INCOMPRESSIBLE FLUID FLOW.—Steady and unsteady pipe flow, theories of turbulent flow; water hammer theory and control; surge tanks; air chambers; the analysis and control of fluid systems; effect of resistance; tapered conductors. 3 units. WOOD

CE 231. STRUCTURAL ENGINEERING.—The application of the fundamental theories of structural action to the design and analysis of structural members; specifications. 3 units. BARTON

CE 232. REINFORCED CONCRETE DESIGN.—Design and analysis of reinforced concrete members including the influence of shrinkage and plastic flow; bond and diagonal tension; prestressed concrete members. 3 units. BROWN

CE 235. FOUNDATION ENGINEERING.—An introduction to methods of analysis, design and construction of foundations. Bearing capacity and settlement of shallow and deep foundations. Soil exploration; excavation and bracing; drainage and stabilization; underpinning. Foundation vibrations. 3 units. VESIĆ

CE 243, 244. SANITARY ENGINEERING UNIT OPERATIONS AND PROCESS DESIGN.—Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and bio-treatment processes. 6 units. BRYAN

CE 250. ENGINEERING ANALYSIS.—General concepts of the solutions of engineering problems with special emphasis on digital and analog computer and numerical methods; deflection and stability; torsion of noncircular beams and multicelled thin-walled structures; vibrations of beams and membranes; structures with both uniform and nonuniform properties and with rigid and nonrigid supports. 3 units. BARTON AND WOOD

CE 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydraulic engineering; materials science; structural engineering; or sanitary engineering. Master's credit only. 6 units. MEMBERS OF THE GRADUATE STAFF

CE 302. THEORY OF PLATES AND SHELLS.—Analysis of stresses and deformation of plates; vibrations of plates; membrane stress systems in shells; cylindrical shell analysis; bending stresses in shells. Prerequisite: CE 201, or CE 205, or equivalent. 3 units. HILL

CE 321. MECHANICS OF IDEAL FLUIDS.—Basic equations of ideal fluid flow; potential and stream functions; vortex dynamics; body forces due to flow fluids; methods of singularities in two-dimensional flows; analytical determination of potential functions; conformal transformations; free-streamline flows. Prerequisite: Mathematics 285, 286 or equivalent. 3 units. HARRAWOOD AND WOOD

CE 322. MECHANICS OF VISCOUS FLUIDS.—Equations of motion of a viscous fluid; general properties and selected solutions of the Navier-Stokes equations; boundary layer equations with selected approximate solutions; laminar boundary layers in axisymmetric and three-dimensional flows; unsteady laminar boundary layers. Prerequisite: Mathematics 285, 286. 3 units.
HARRAWOOD AND WOOD

CE 331, 332. ADVANCED STRUCTURAL DESIGN AND ANALYSIS.—Analytical and behavior concepts of structural components as related to the design of structural systems; classical methods; numerical and approximate techniques; be-

havior of structural elements under static and dynamic loading; buckling behavior. Prerequisite: CE 231 or equivalent. 6 units. Barton

CE 335. MECHANICAL BEHAVIOR OF SOILS.—Origin of soils, soil minerals and processes of soil formation; physical chemistry of multiphase systems and soil structure. Elements of soil stabilization; permeability and flow of water through soils: capillary and osmotic phenomena; seepage problems; soil compressibility; theory of consolidation; sheer strength and failure criteria. Stress-strain relationships, volume changes and pore pressures during shear, strength properties. Advanced laboratory soil testing techniques. 4 units. Vesić

CE 336. ADVANCED SOIL MECHANICS.—Theories of plastic and elastic equilibrium of soil masses and their application to analysis of problems such as: pressure on retaining walls, anchored bulkheads, cofferdams, silos, shafts, tunnels; stability of slopes and earth dams; stresses and settlement in soil masses and pavements, piles and pile groups subjected to lateral loads; elements of soil dynamics. Prerequisite: CE 335. 4 units. Vesić

CE 365. ADVANCED TOPICS IN CIVIL ENGINEERING.—Opportunity for study of advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 units.
Members of The Graduate Staff

Department of Electrical Engineering

Chairman: Thomas George Wilson
Director of Undergraduate Studies: Otto Meier, Jr.
Director of Graduate Studies: Harry Ashton Owen, Jr.

Professors

Herbert Lee Krauss (February 1965), *Visiting*
Ph.D. (Yale)

Harry Ashton Owen, Jr. (1951)
Ph.D. (North Carolina State)

Otto Meier, Jr. (1934)
Ph.D. (Pennsylvania)

¶ Charles Rowe Vail (1939)
Ph.D. (Michigan)

¶ Thomas George Wilson (1959)
Sc.D. (Harvard)

Associate Professors

John Leslie Artley (1955)
D.Eng. (Johns Hopkins)

*Wellington Wesley Koepsel (1963)
Ph.D. (Oklahoma State)

Robert Mercer Burger (1962), *Adjunct*
Ph.D. (Brown)

¶ Edward Kready Kraybill (1939)
M.S.E. (Michigan)

Assistant Professors

Rhett Truesdale George, Jr. (1957)
M.S.E. (Florida)

*James Thomas McKeel (1956)
M.S. (North Carolina State)

Theo Clyde Pilkington (1958)
Ph.D. (Duke)

Lecturers

John Edward Jenkins, Jr. (1964)
B.S.E.E. (Duke); M.B.A. (Harvard)

¶Philip Harold Trickey (February 1965) *Visiting*
M.S.E.E. (Maine)

†Billy Brown Olive (1957)
B.S.E.E. (Duke); LL.B. (St. John's)

¶ Bruce Arrington Wells (1964), *Visiting*
M.S.E.E. (Oregon State)

Jimmie Jack Wortman (1964)
M.S. (Duke)

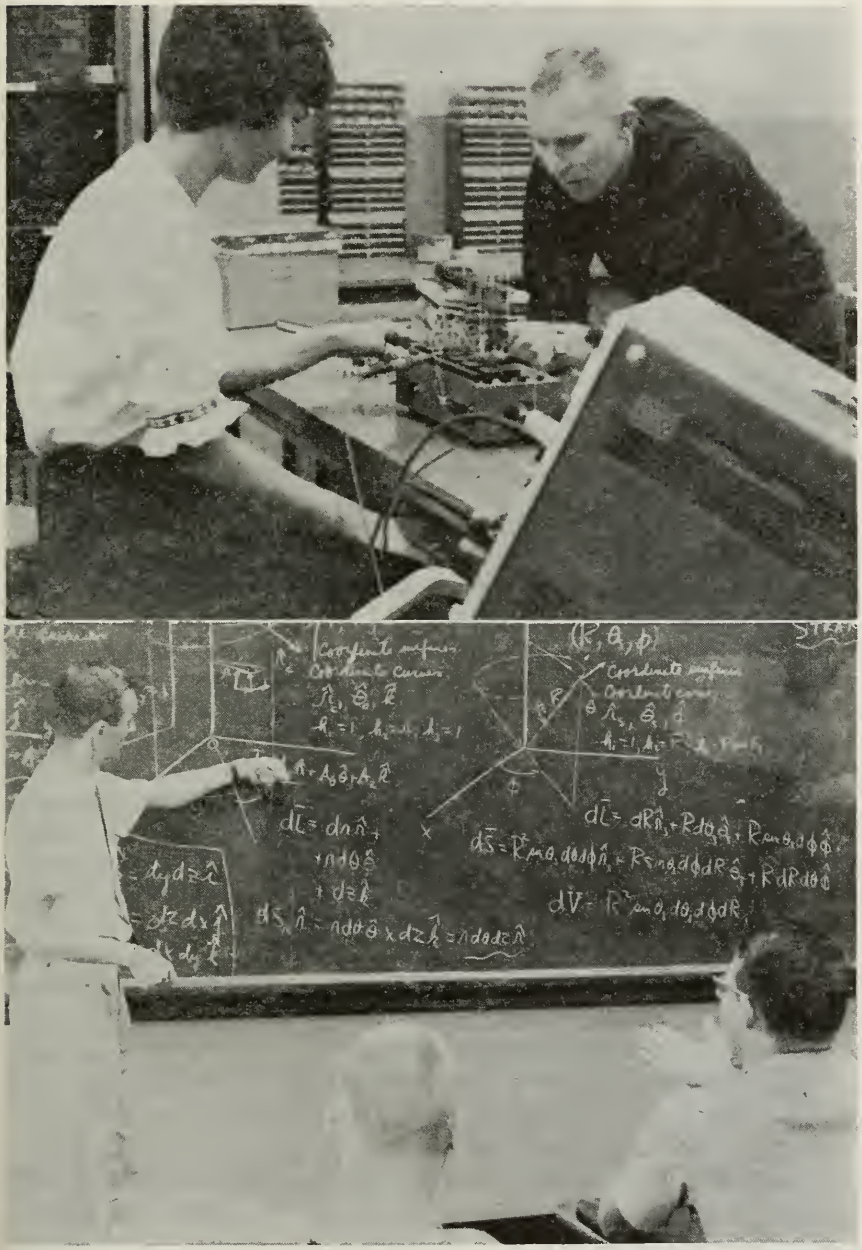
Instructors

Richard Gaylen Absher (1963)
M.S. (New Mexico)

Ralph Willet Barnes (1964)
B.S.E.E. (Duke)

David Frank Palmer (1963)
M.S. (New Mexico)

¶ Registered Professional Engineer.
† Registered Patent Attorney.
* Resigned, Effective August 31, 1964.


Coordinate surfaces
Coordinate Curves
$d\vec{L} = dR\hat{R} + Rd\theta\hat{\theta} + R\sin\theta\, d\phi\hat{\phi}$
$d\vec{S} = R^2 \sin\theta\, d\theta d\phi \hat{R} = R\sin\theta\, d\phi dR\hat{\theta} + RdRd\theta\hat{\phi}$
$dV = R^2 \sin\theta\, d\theta d\phi dR$

ELECTRICAL ENGINEERING utilizes the electrical and magnetic forces of nature and properties of matter to supply human needs. To an increasing degree its products and services influence the daily living of most of the world's population. It is concerned with the *processing and transmitting of information*—as in radar, television, radio and wire telephony, measurement, electronics, computation, and control. It is equally concerned with the *processing, transmitting, and controlling of energy*—as in solid state converters, magnetohydrodynamic generators, nuclear reactors, rotating machines, power systems, and automatic industrial processes. It provides most of our labor-saving home appliances and many of the instruments of modern scientific research and of modern medical practice.

The professional electrical engineer may engage in consulting, teaching, research, development, design, manufacturing, operation, maintenance, management and sales. His education must therefore provide a fundamental understanding of both the science of electrical engineering, which is based on mathematics and the physical sciences, and the art of electrical engineering, which depends on human imagination and judgment. It must also prepare him to serve as a responsible member of society by providing him with an appreciation of the humanities and the social sciences.

The program in electrical engineering at Duke, therefore, does not stress the mere acquisition of specific skills and methods, but seeks, in both classroom and laboratory, to stimulate students to think creatively in terms of fundamental concepts. It is hoped that, once started, creativity may become a habit.

Such a program requires an able staff, extensive library resources, and well-equipped laboratories, such as are found here. Some idea of the range of interests in electrical engineering which are included in this program may be conveyed by a brief survey of the laboratory activities of the Department.

In the *Fields and Circuits Laboratory* the configurations of two- and three-dimensional fields are studied by several different analog techniques. Complex network functions are studied by means of an electrolytic tank mapper. Nonsinusoidal waves are synthesized and analyzed, and oscillographic studies are made of both steady-state and transient behavior of direct-current circuits and single-phase and polyphase alternating-current circuits.

The *Solid-State Materials Laboratory* is well-equipped for both instructional and research projects in which the macroscopic properties of materials, as exploited in devices, are studied at the microscopic and molecular levels. An X-ray diffraction diffractometer, a 9½-inch magnet, a spin-echo spectrometer, a vacuum deposition sys-

tem, and metallurgical and stereoscopic microscopes are utilized in this work.

In the *Ferromagnetics Laboratory* investigations are being conducted into such properties of ferromagnetic materials as magneto-thermal, magneto-optical, magneto-resistive and magneto-strictive effects.

Research in the *Superconducting Circuits and Thin-Films Laboratory* is directed toward exploiting for engineering application some of the unique physical phenomena which are observed to obtain at temperatures in the vicinity of absolute zero. Related thin-film research is in progress. A major facility of this laboratory is an electron microscope providing a resolution of 7Å.

The *Electronics Laboratories* are equipped for the study of the physical behavior of basic electronic components and of advanced electronic devices throughout the sub-radio frequency region.

In the *Radio-Frequency Laboratory* studies are made of radio-frequency systems and their component parts throughout the radio-frequency spectrum. Applications to television and radar are shown.

In the *Energy Conversion Laboratory* the principles of generation, transformation, and control of energy are studied as they are applicable to large-scale power systems and small self-contained systems. Thermoelectric generators, photovoltaic sources, transformers, a-c and d-c motors and generators, and their associated controls are included in this work.

In the *Automatic Control Systems Laboratory* studies are made of the principles underlying the fields of instrumentation and automatic control. Modern, high-performance equipment is available for synthesizing control systems and for determining control system performance.

The *Computer Laboratory* contains two general-purpose electronic analog computers. These devices are used in solving higher-order differential equations that are descriptive of the dynamic behavior of complex physical systems. A card-punch machine is available for use in programming problems for solution on the digital computer at the University Digital Computer Laboratory.

In the work of the *Spacecraft Systems Laboratory* principles from all phases of electrical engineering are brought to bear upon problems encountered in modern spacecraft technology.

In the *Spacecraft Telemetry Systems Laboratory* research centers on crosscorrelation techniques for the recovery of information contained in noisy signals received from scientific satellites and space probes.

Through *Amateur Radio Station W4AHY,* which is licensed to operate on the popular amateur bands using both voice and code

transmission, interested engineering students who hold licenses may gain practical experience in short-wave radio.

Program of Studies for the Degree of Bachelor of Science in Electrical Engineering

This program is for students who matriculated prior to September 1965; students admitted after that date enter the freshman program outlined on page 12.

All engineering curricula are undergoing thorough restudy and re-evaluation, hence the program which follows is subject to modification beginning with the academic year 1965-66.

Sophomore Year

FIRST SEMESTER			S.H.
Econ	51	Principles of Economics	3
EE	53	E. E. Fundamentals	1
EE	55	Electric Networks I	4
Engl	93	Technical Communication	3
Math	63	Intermediate Calculus	3
Phys	41	General Physics	4
PE		Physical Education	1
			19

SECOND SEMESTER			S.H.
Econ	52	Principles of Economics	3
†EE	56	Electric Networks II	4
Engrg	60	Engineering Mechanics	4
Math	64	Intermediate Calculus	3
Phys	42	General Physics	4
PE		Physical Education	1
			19

Junior Year

FIRST SEMESTER			S.H.
EE	109	Electromagnetic Systems	4
EE	111	Electrical Prin. Lab	2
Engrg	107	Mechanics of Materials	3
Math	111	Applied Math Analysis I	3
Phys	161	Modern Physics	3
‡Approved Elective			3
			18

SECOND SEMESTER			S.H.
†EE	110	Electromagnetic Systems	4
EE	112	Electrical Prin. Lab	1
Engrg	128	Fluid Mechanics	3
Math	112	Applied Math Analysis II	3
ME	103	Thermodynamics	3
ME	116	M. E. Laboratory	1
‡Humanities-Social Studies Elective			3
			18

Senior Year

FIRST SEMESTER			S.H.
EE	165	Seminar	1
EE	181	Electronic Networks	3
EE	183	Electronics Laboratory	1
EE	191	Electric Machinery	3
EE	193	Elec. Mach. Laboratory	1
‡EE Elective			3
‡Approved Elective			3
‡Humanities-Social Studies Elective			3
			19

SECOND SEMESTER			S.H.
EE	166	Seminar	1
EE	182	Electronic Networks	3
EE	184	Electronics Laboratory	1
EE	192	Electric Machinery	3
EE	194	Elec. Mach. Laboratory	1
‡Approved Elective			3
‡Approved Elective			3
‡Humanities-Social Studies Elective			3
			18

† Courses which must be passed before engineering academic standing can be advanced. (See page 54.)

‡ Part of a planned program of electives to be chosen in consultation with the Advisor. A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering. All other credits earned in Air Science or Naval Science are taken in addition to the minimum program.

Undergraduate Courses

EE 53. ELECTRICAL ENGINEERING FUNDAMENTALS.—Survey of electrical engineering profession; role of engineering and professional engineering societies in national life; engineering economy; engineering law; technical engineering problems; basic philosophy of engineering education; introduction to staff, curriculum, and facilities of Department of Electrical Engineering. One two-hour session. 1 s.h.
Kraybill and Pilkington

EE 55. ELECTRIC NETWORKS I.—Physical nature of circuit parameters and sources of excitation; volt-ampere relations for circuit elements; network topology; network equations using loop currents and node voltages; solutions of network differential equations by classical and transform methods. Concurrent: Physics 41; Mathematics 63. Three class sessions and one two-hour computation. 4 s.h.
Palmer and Vail

EE 56. ELECTRIC NETWORKS II.—Network impedance and admittance functions; steady-state response to sinusoidal forcing; Fourier series analysis; pole-zero analysis of networks; matrices in network analysis; introduction to synthesis of reactance networks. Prerequisite: EE 55. Concurrent: Mathematics 64. Three class sessions and one two-hour computation. 4 s.h. George and Palmer

EE 109-110. ELECTROMAGNETIC SYSTEMS.—Mathematical and physical consideration of particles and materials in electromagnetic fields: vector and tensor notation; continuum concepts; waves and diffusion; Maxwell's equations; static and quasi-static fields; energy, power flow, and impedance; particle ballistics; electron emission; resistance, capacitance, and inductance of systems of conductors; energy conversion with motion; conductors, semiconductors, superconductors, dielectrics, and magnetic materials. Prerequisite: EE 56. Concurrent: Mathematics 111. Three class sessions and one two-hour computation. 8 s.h. Absher and Artley

EE 111-112. ELECTRICAL PRINCIPLES LABORATORY.—Instruction in electrical laboratory techniques; experimental study of basic principles of electromagnetics, electronics, and electric and magnetic circuits. Prerequisite: EE 56. Concurrent: EE 109-110. Two three-hour laboratory periods throughout first semester; one throughout second semester. 3 s.h. Absher, Frekko, and Palmer

EE 123. FUNDAMENTALS OF ELECTRICAL ENGINEERING.—Introductory treatment of electrical engineering fundamentals for students majoring in other branches of engineering: principles of electric circuits, fields, and electronics. Prerequisites: Mathematics 63 and Physics 42. Concurrent: EE 125. Three class sessions. 3 s.h. Barnes and Wortman

EE 124. INDUSTRIAL ELECTRICAL ENGINEERING.—Introductory treatment of industrial applications of electrical engineering fundamentals for students majoring in other branches of engineering: alternating- and direct-current machinery; electronic and electromagnetic control systems; illumination principles. Prerequisite: EE 123. Concurrent: EE 126. Three class sessions. 3 s.h. Barnes

EE 125. ELECTRICAL FUNDAMENTALS LABORATORY.—Laboratory course paralleling course EE 123, with which it should be taken concurrently. One three-hour laboratory. 1 s.h. Bumgardner, Feng and Owsley

EE 126. INDUSTRIAL ELECTRICAL LABORATORY.—Laboratory course paralleling course EE 124, with which it should be taken concurrently. One three-hour laboratory. 1 s.h. Frekko and Owsley

EE 127. *ELECTRONICS FOR ENGINEERS.—Introductory treatment of principles and applications of engineering electronics for students majoring in other branches of engineering: amplifiers; feedback; basic communications and control circuits; electronic computers. Prerequisite: EE 123 and permission of instructor. Three class sessions. 3 s.h. Staff

* Offered only upon sufficient demand; enrollment limited.

EE 159. *TRANSMISSION.—Development of theory underlying transmission of electric energy over conductors at both power and communication frequencies. Two class sessions and one two-hour computation. Prerequisite: EE 110; Mathematics 111. Elective for electrical majors. 3 s.h. STAFF

EE 165-166. ELECTRICAL ENGINEERING SEMINAR.—A course which provides the opportunity for students to keep abreast of current progress in engineering and to improve their ability to communicate more effectively. Required for seniors; juniors may participate, but without credit. One class session. 2 s.h. STAFF

EE 173-174. *PROJECTS IN ELECTRICAL ENGINEERING.—A course which may be undertaken only by seniors who show special aptitude, or who may have had previous experience directly related to the proposed project. The consent of the Chairman of the Department must be obtained before registering. Elective for electrical majors. 1-6 s.h. STAFF

EE 177. *ENERGY TRANSMISSION AND RADIATION.—A more advanced treatment of electromagnetic theory than is afforded by EE 109-110, with particular application to wave guides and antennas. Prerequisite: EE 110 and permission of instructor. Three class sessions. 3 s.h. ARTLEY

EE 179. *ADVANCED ELECTRICAL MEASUREMENTS.—Theory and practice of measurements of electrical quantities at extremes of voltage, current, power, and frequency. Two class sessions and one three-hour laboratory. Prerequisite: EE 110 and permission of instructor. 3 s.h. OWEN

EE 181-182. ELECTRONIC NETWORKS.—Advanced topics in engineering electronics: piece-wise linear approximation for nonlinear operation and incremental models for linear operation of basic electronic circuits; narrow- and wide-band amplifiers; feedback amplifiers; oscillators; modulation and demodulation; microwave devices; communication systems. Prerequisite: EE 110. Concurrent: EE 183-184. Three class sessions. 6 s.h. GEORGE, KRAUSS, AND PILKINGTON

EE 183-184. ELECTRONICS LABORATORY.—Laboratory course paralleling and integrated with course EE 181-182, with which it should be taken concurrently. One three-hour laboratory. 2 s.h. BARNES, FENG, GEORGE, AND ROE

EE 191-192. ELECTRIC MACHINERY.—Application of circuit and field principles to underlying theory of static and rotating electric machinery; mathematical techniques for analyzing transformers and electromechanical energy converters as individual devices and when interconnected into systems. Prerequisite: EE 110. Concurrent: EE 193-194. Three class sessions. 6 s.h. JENKINS AND MEIER

EE 193-194. ENERGY CONVERSION LABORATORY.—Selected experiments in energy conversion combining the theory and practice of transformers, electromechanical devices including motors and generators, photovoltaic sources, thermoelectric generators, static d-c to a-c and d-c to d-c converters. Prerequisite: EE 112. Concurrent: EE 192-193. 2 s.h. BUMGARDNER, MEIER, AND ROE

EE 195. *NUCLEAR ENGINEERING FUNDAMENTALS.—Review of nuclear physics; fission and the chain reaction; nuclear reactor principles and concepts; materials, instrumentation, and control of nuclear reactors; selected topics in nuclear engineering. Prerequisite: permission of instructor. 3 s.h. MEIER AND WORTMAN

EE 197. SOLID-STATE MATERIALS.—Prediction and explanation of the response of ferroelectric, ferromagnetic, ferrimagnetic, and semiconductor materials to thermal, electric, magnetic and stress fields. Exploration of possibilities of improving the materials. Two class sessions and one three-hour laboratory. Prerequisites: Mathematics 111 and one course from among Physics 161, EE 110, CE 118, and ME 59. 3 s.h. PILKINGTON

EE 199. *LINEAR FEEDBACK SYSTEMS.—Analysis and design of linear, continuous-data feedback control systems; stability tests; time and frequency domain

* Offered only upon sufficient demand; enrollment limited.

methods; root locus method; performance specifications; study of electrical, mechanical, hydraulic, aerodynamic, pneumatic, and thermal systems. Two class sessions and one three-hour laboratory. Prerequisite: permission of instructor. 3 s.h. Wells

Programs of Studies in Electrical Engineering for the Degrees of Master of Science and Doctor of Philosophy

Through the Graduate School of Arts and Sciences, the Department of Electrical Engineering offers work leading to the degrees of Master of Science and Doctor of Philosophy. Students on these programs may specialize in any of the following fields: solid-state materials and devices, ferromagnetics, superconducting circuits, instrumentation, electronics, microwaves, computers, and automatic control, energy conversion, and information processing. Major credit in electrical engineering may be given for graduate level physics courses in the area of microwaves.

A minimum of 30 units of earned graduate credit is required for the M.S. degree: at least 12 in engineering, 6 in related minor work (normally, mathematics or natural science), 6 in either the major or minor subject or in other areas appropriate to the program, and 6 for a research-based thesis. There is no language requirement for this degree.

The minimum requirements for the Ph.D. degree include: 48 units of course work (24 in engineering; 12 in related minor work, normally mathematics or natural science; 12 in either the major or minor subject or other areas approved by the major department and the Dean of the College of Engineering) and 12 units for a research-based dissertation. In addition, a reading knowledge of two foreign languages is required (normally two of the following: French, German, or Russian).

A minimum prerequisite to the graduate courses in electrical engineering is a basic knowledge of differential equations, electric and magnetic field theory, and the theory of networks. A previous course in modern physics is recommended.

Graduate Courses

PROFESSOR WILSON, CHAIRMAN; PROFESSOR OWEN, DIRECTOR OF GRADUATE STUDIES; PROFESSORS MEIER AND VAIL; VISITING PROFESSOR KRAUSS; ASSOCIATE PROFESSORS ARTLEY AND BURGER; ASSISTANT PROFESSORS GEORGE AND PILKINGTON; VISITING LECTURER WELLS

EE 201. ENERGY SYSTEMS.—Application of general energy concepts to specific engineering devices and systems; use of mathematical models to describe concepts

of energy storage, transfer, transformation, and control that are applicable to electromagnetic, mechanical, fluid, and thermal systems; the Lagrangian, Hamiltonian formulation, and tensors. Prerequisite: permission of instructor. 3 units.
ARTLEY

EE 203, 204. INFORMATION SYSTEMS.—General concepts of information storage, transfer, and processing: information theory, coding, noise theory, and response of information-handling systems in the time and frequency domains. Applications of information concepts to specific engineering situations: modulation, sampling, optimum filtering, detection in presence of noise, and comparison of various systems. Prerequisite: permission of instructor. 6 units. GEORGE AND OWEN

EE 207. NETWORK SYNTHESIS.—Linear network theory, including a review of time and frequency domain analysis; network graphs; network functions and realizability condition; driving point impedance synthesis of passive networks; driving point and transfer specifications; approximation methods. Prerequisite: permission of instructor. 3 units. KRAUSS, OWEN, AND VAIL

EE 211. SOLID STATE THEORY.—The fundamental theory of wave motion in solids, including wave mechanics; variational method; perturbation theory; many-electron problems; one-electron approximation; free-electron approximation; electron spin; Brillouin zones; time-dependent Schrodinger's equation; and transition probabilities. Introduction to the thermodynamics of solids, including Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; ensembles; entropy; and free-energy functions. Prerequisite: permission of instructor. 3 units.
ARTLEY, BURGER, PILKINGTON, AND VAIL

EE 212. SOLID STATE MATERIALS.—Concepts of solid state physics as applied to engineering materials; electrical, magnetic, thermal, and mechanical properties of solids; dielectrics; ferroelectrics; semiconductors; magnetic materials; and superconductors. Prerequisite: EE 211. 3 units.
ARTLEY, BURGER, PILKINGTON, AND VAIL

EE 222. NONLINEAR ANALYSIS.—Introduction to methods of analyzing engineering systems described by nonlinear differential equations: analytic, numerical, graphical, and series approximation methods; analysis of singular points; stability of nonlinear systems. Application of various methods, such as the modified Euler, Runge-Kutta, isoclines, perturbation, reversion, variation of parameters, residuals, harmonic balance, Bendixon, and Liapounov to phenomena of nonlinear resonance, subharmonics, relaxation oscillations, and forced oscillating systems. Prerequisite: permission of instructor. 3 units. WILSON

EE 231. *NUCLEAR ENGINEERING.—Review of nuclear physics; fission and the chain reaction; nuclear reactor principles; materials, instrumentation, and control of nuclear reactors; selected applications and techniques of nuclear engineering. Prerequisite: permission of instructor. 3 units. MEIER

EE 241. FEEDBACK CONTROL SYSTEMS.—Analysis and design of linear sampled-data systems; linear systems subjected to random inputs; analytical design using mean square error and integral square error criteria; nonstationary and nonlinear systems. Prerequisite: permission of instructor. 3 units.
WELLS AND WILSON

EE 259. *ADVANCED ELECTRIC ENERGY CONVERSION.—Equations of motion of electromechanical systems; fields and lumped parameters, state function concepts; mathematical techniques for analyzing electromechanical devices and systems; transducers; unified treatment employing matrix, tensor, and block-diagram concepts to obtain response under static and dynamic conditions; the generalized rotating machine. Prerequisite: permission of instructor. 3 units.
MEIER AND WILSON

EE 265. *ADVANCED TOPICS IN ELECTRICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within the electrical

* Offered only upon sufficient demand; enrollment limited.

engineering department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 units. Members of the Graduate Staff

EE 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under direction of a member of the staff in one of the following fields: dielectric materials; magnetic materials; energy conversion; instrumentation; high voltage phenomena. Master's thesis credit only. 6 units.
Members of the Graduate Staff

EE 311. QUANTUM THEORY IN THE ENGINEERING OF MATERIALS.—Concepts of the quantum theory of solids as applied to the molecular design of engineering materials. Topics selected will vary somewhat with the interests of the class, but the importance of quantized fields in crystals (phonons, magnons, plasnons, excitons, and polarons) and the interaction of these fields will be stressed. Prerequisites: EE 212 and Physics 316. 3 units. Pilkington

EE 313. *MAGNETICS.—A study of ferromagnetic and ferrimagnetic materials, including effects of thermal conditions and treatment, mechanical stress, magnetic field intensity, crystal structure, and macroscopic geometry. Study emphasizes relationships of fundamental concepts of engineering interest. Prerequisite: EE 211 or equivalent. 3 units. Artley and Wilson

EE 315, 316. *SOLID-STATE DEVICES.—Study of terminal parameters and functional characteristics of electronic devices in terms of the properties and structural configurations of their constituent materials. First semester emphasis on such semiconductor devices as transistors and on integrated semiconductor circuits; second semester emphasis on other types of solid-state devices. Pre-requisite: permission of instructor. 6 units. Burger and Pilkington

EE 321. NONLINEAR ELECTROMAGNETICS.—Mathematical description of nonlinear magnetic and semiconductor characteristics; transient and steady-state analysis and synthesis of nonlinear systems with application to such topics as magnetic amplifiers, frequency converters, oscillators, computer logic, and switching devices. Prerequisite: permission of instructor. 3 units. Wilson

EE 342. OPTIMUM CONTROL SYSTEMS.—Use of variational methods in control system design; classical calculus of variations; dynamic programming; Pontriagin's maximum principle; computer applications in control. Prerequisite: permission of intsructor. 3 units. Staff

EE 343. NONLINEAR CONTROL SYSTEMS.—Analysis and design of nonlinear feedback control systems; approximations for small and for large disturbances; phase-plane analysis; describing-function techniques; relay servomechanisms, optimum and quasi-optimum performance; nonlinear compensation. Prerequisite: permission of instructor. 3 units. Wells and Wilson

EE 399. *SPECIAL READINGS IN ELECTRICAL ENGINEERING.—Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 units.
Members of the Graduate Staff

* Offered only upon sufficient demand; enrollment limited.

Department of Mechanical Engineering

Acting Chairman and Director of Undergraduate and Graduate Studies:
Van Leslie Kenyon, Jr.

Professors

Milan Djordjević (1964)
Visiting
Dr. Ing. (Munich)

¶ Van Leslie Kenyon, Jr. (1945)
M.M.E. (Delaware)

**¶ John Nelson Macduff (1956)
M.M.E. (New York University)

*¶ James Lathrop Meriam (1963)
Professor of Engineering Mechanics
Ph.D. (Yale)

Associate Professors

¶ Thomas Allan Boyle (1957)
M.S. in M.E. (Lehigh)

¶ Ernest Elsevier (1950)
M.S. in M.E. (Georgia Institute of Technology)

George Wilbur Pearsall (1964)
Sc.D. (Massachusetts Institute of Technology)

Assistant Professors

¶ Gale Herbert Buzzard (1957)
M.S. (Duke)

¶ Charles Morgan Harman (1961)
Ph.D. (Wisconsin)

¶ Ralph Elton Lewis (1941)
M.S. in M.E. (Illinois)

¶ Thomas Hawkes Nash, Jr. (1959)
B.S. (Iowa State)

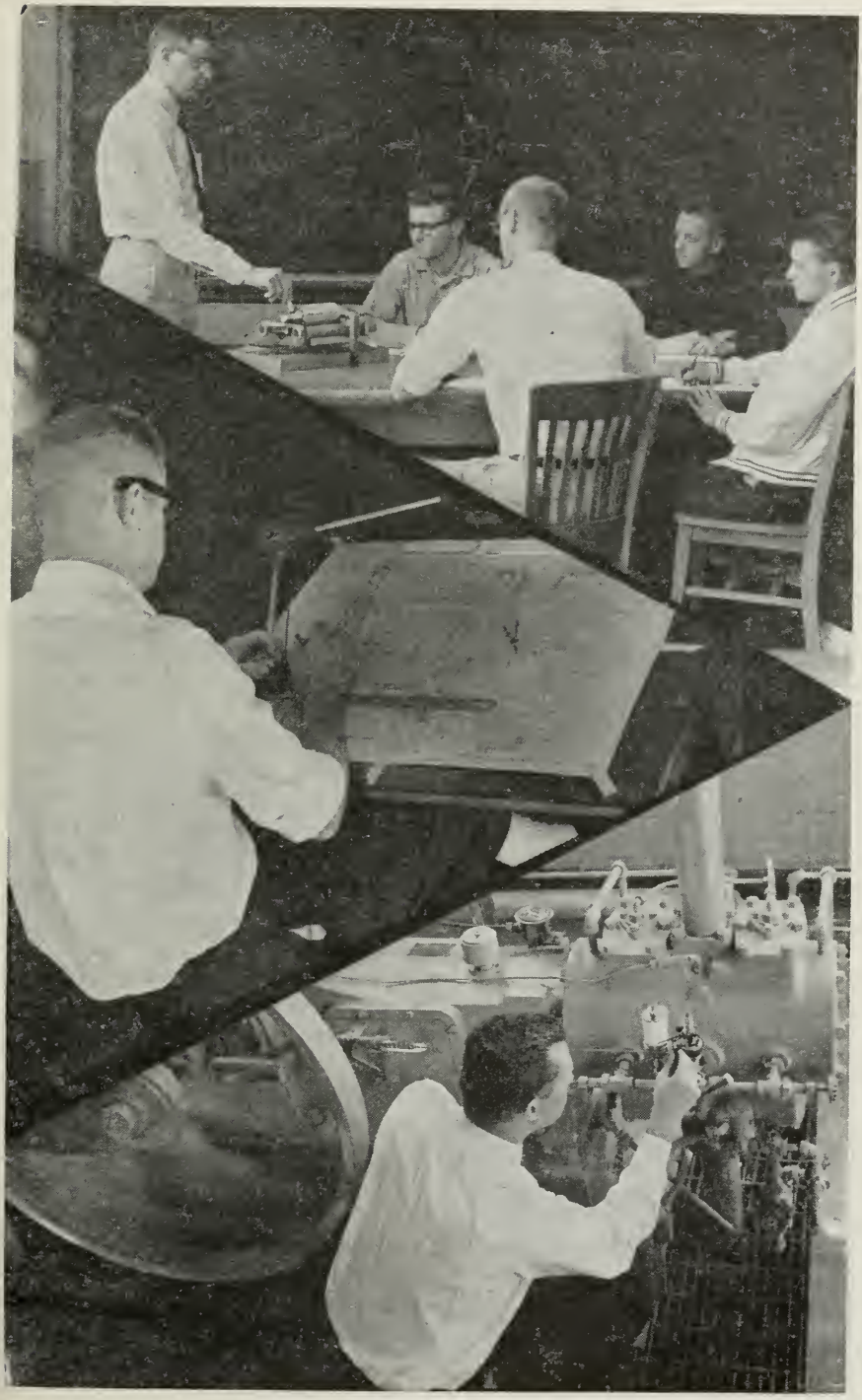
Lecturer

Forest Orion Mixon, Jr. (1963)
Visiting
Ph.D. (Delaware)

THE MECHANICAL ENGINEER is concerned with the design and construction of equipment to convert energy from natural sources into useful work and to utilize energy effectively to process goods. He is also concerned with the organization of men and machines for the manufacture of products. To fulfill these functions, the mechanical engineer must possess a thorough knowledge of the basic sciences and be adept in using this knowledge to find optimum solutions to the problems with which he is confronted. In general, he would pursue a career in one of the following comprehensive fields: (1) research, development and design; (2) production, manufacturing and operation; and (3) management.

The mechanical engineering curriculum at Duke University provides a balance between basic sciences, mathematics, engineering sciences, social sciences, humanities and professional engineering courses. Flexibility is provided in the form of electives by which the

¶ Registered Professional Engineer.
** Sabbatical Leave, Academic Year, 1964-65.
* Leave of Absence, Second Semester, 1964-65.



student may emphasize particular goals of his own choosing. The elective programs may be chosen to provide a strong minor in mathematics, the physical sciences, economics, or the humanities. Outstanding students may elect in their senior year projects which test and develop their ability to do research work.

Digital computer programming is introduced at the freshman level and is used in regular course work throughout the remaining years. Programs are prepared by students and are processed on the large-scale computer in the adjacent Mathematics-Physics Building.

The department has several small *analog computers,* and participates in the central facility of the College.

The laboratories provide facilities both for undergraduate instruction and for graduate level research in each of the major fields of mechanical engineering. Instrumentation includes many cathode-ray oscilloscopes, analog computers, strain-gage bridges, a hot-wire anemometer, recording oscillograph, and photographic equipment.

A modern, well-equipped *materials laboratory* is available for examining the structures of materials and relating these to the properties of the materials and to the methods of processing. Polymers and ceramics, as well as naturally-occurring materials, may be prepared and examined with the facilities available. In addition, testing equipment and furnaces are provided for determining the effects on properties of changes induced by heat treatment.

Basic *thermodynamic experiments* are performed on such apparatus as a large single-stage air compressor, steam turbines, heat exchangers, experimental refrigeration equipment and *internal combustion engines,* including Diesel and automotive engines. A CFR variable compression-ratio engine, in a separate laboratory with complete control and testing equipment, is available for further investigations. Indicator diagrams can be obtained either through electronic strain-gages or with purely mechanical devices.

Heat flow problems are studied by determining temperature distributions on actual equipment. The results are compared with those obtained from analog water tanks, digital computer calculations, and an electric analog system.

The *flow of fluids* is studied on a water table equipped for shock wave investigations and on supersonic flow apparatus, as well as with an assortment of the fans, nozzles, and pumps commonly found in such laboratories.

The behavior of *mechanical systems* is an area of great, and rapidly growing, importance in mechanical engineering. Several simple systems have been built for undergraduate study of vibratory and basic feedback control phenomena, while more elaborate systems are used for advanced study. Auxiliary equipment available includes

vibration tables and shakers and a shock stand as well as pickups of several varieties, amplifiers, recorders and the analog computers.

Shop facilities are available to support student as well as faculty projects, and for special instruction.

Program of Studies for the Degree of Bachelor of Science in Mechanical Engineering

This program is for students who matriculated prior to September 1965; students admitted after that date enter the freshman program outlined on page 12.

All engineering curricula are undergoing thorough restudy and re-evaluation, hence the program which follows is subject to modification beginning with the academic year 1965-66.

Sophomore Year

FIRST SEMESTER			S.H.
Engrg	60	Statics and Dynamics	4
Math	63	Intermediate Calculus	3
ME	52	Kinematics Kinetics	3
Phys	41	General Physics	4
‡ Humanities-Social Studies Elective			3
PE		Physical Education	1
			18

SECOND SEMESTER			S.H.
Engrg	107	Mechanics of Materials	3
Engrg	109	Materials Laboratory	1
†Math	64	Intermediate Calculus	3
ME	105	Dynamics of Fluids	3
Phys	42	General Physics	4
‡Humanities-Social Studies Elective			3
PE		Physical Education	1
			18

Junior Year

FIRST SEMESTER			S.H.
EE	123	Fundamentals of E. E.	3
EE	125	Elec. Fundamentals Lab.	1
Math	111	Applied Math Analysis I	3
ME	101	Thermodynamics	3
†ME	106	Heat Transfer	3
ME	141	Machine Design	3
‡Humanities-Social Studies Elective			3
			19

SECOND SEMESTER			S.H.
EE	124	Industrial E. E.	3
EE	126	Industrial Elec. Lab.	1
Engl	93	Technical Communication	3
Math	112	Applied Math Analysis II	3
†ME	102	Thermodynamics	3
ME	114	M. E. Laboratory	2
†ME	142	Machine Design	3
			18

Senior Year

FIRST SEMESTER			S.H.
Econ	51	Principles of Economics	3
ME	59	Materials and Processes	3
ME	159	M. E. Laboratory	1
ME	171	Response of Phys. Systems	3
ME	173	Seminar	1
ME		Elective	3
‡Approved Electives			6
			20

SECOND SEMESTER			S.H.
ME	156	Combustion Engines	3
ME	160	M. E. Laboratory	1
ME	162	Power Plants	3
ME	174	Seminar	1
‡Approved Electives			6
‡Humanities-Social Studies Elective			3
			17

† Courses which must be passed before engineering academic standing can be advanced. (See page 54.)

‡ Part of a planned program of electives to be chosen in consultation with the Advisor. A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering. All other credits earned in Air Science or Naval Science are taken in addition to the minimum program.

Undergraduate Courses

ME 52. KINEMATICS, KINETICS.—Analytical and numerical studies of displacement, velocity, and acceleration in mechanical elements and systems. Synthesis and analysis of mechanisms for automatic machines, application of work, energy, impulse and momentum. Prerequisite: Engrg 2; concurrent: Math 63, Phys 41. 3 s.h. NASH

ME 59. MATERIALS AND PROCESSES.—Elementary metallurgy and introduction to modern theories of the solid state; selection and properties of engineering materials and effect of forming processes upon properties. Prerequisite: Chem. 2. 3 s.h. PEARSALL

ME 101-102. ENGINEERING THERMODYNAMICS.—A basic study of the laws of thermodynamics and their use in engineering analysis and design. Properties of pure substances; vapor cycles; fluid flow; thermodynamic machinery; introduction to combustion processes. Prerequisite: Chem 1, Phys. 42; concurrent: Math 64. 6 s.h. BOYLE, ELSEVIER AND HARMAN

ME 103. THERMODYNAMICS.—A terminal course in thermodynamics and its engineering applications for civil and electrical engineering students. The basic laws of thermodynamics; gases; vapors; elements of combustion and heat transfer. Prerequisite: Chem 1, Phys 42; concurrent: Math 64. 3 s.h.
ELSEVIER, MIXON AND PEARSALL

ME 105. DYNAMICS OF FLUIDS.—A study of liquids at rest and in motion. Principles of laminar and turbulent flow through pipes, orifices, nozzles, and metering devices; impulse and momentum concepts; vortex action, pumps, turbines and fluid couplings; resistance of immersed and floating bodies. Prerequisite: Phys 41, Math 63. 3 s.h. BUZZARD

ME 106. HEAT TRANSFER.—A basic course covering the elements of radiation, conduction, and convection. Methods of temperature measurement, steady and transient heat flow, analytical and numerical methods. Concurrent: ME 102, 105: Math 64. 3 s.h. KENYON AND MIXON

ME 114. JUNIOR MECHANICAL ENGINEERING LABORATORY.—Measurement of mechanical and thermodynamic properties of systems. Student planing and reporting of laboratory experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Concurrent: ME 101-102, ME 105, 106. 2 s.h. STAFF

ME 116. MECHANICAL ENGINEERING LABORATORY.—Primarily for civil and electrical engineering students. Selected laboratory experiments in measuring mechanical and thermodynamic properties of systems. Student planning of experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Concurrent: ME 103. 1 s.h. STAFF

ME 128. *DYNAMICS OF GASES.—The flow of compressible fluids at high velocities. One-dimensional compressible flow: area change; normal shock; friction and heat transfer; Mach number. Prerequisite: ME 102; concurrent: ME 106. 3 s.h. BUZZARD

ME 141. MACHINE DESIGN.—Elements of mechanism with special attention to the role of invention in mechanical design. Velocity and acceleration in mechanisms from both scalar and vector viewpoints. Prerequisite: Math 63; concurrent: ME 52, E 57 or 60. 3 s.h. BOYLE, BUZZARD AND NASH

ME 142. MACHINE DESIGN.—Continuation of ME 141. Static and dynamic forces in machinery. The instant center; theory of gear tooth profiles. Design of machine elements, such as gears, springs, and bearings; complex parts. Prerequisite: ME 141; concurrent E 107. 3 s.h. BOYLE AND NASH

* Offered only upon sufficient demand; enrollment limited.

ME 153. *HEATING, AIR CONDITIONING AND REFRIGERATION.—Principles of thermodynamics, heat transfer and fluid flow applied to comfort and industrial air conditioning. Cycles and equipment for heating, cooling, and humidity control. Air transmission and distribution. Modern vapor compresson, absorption and low temperature refrigeration cycles and systems. Prerequisite: ME 102 and 106. 3 s.h. Elsevier

ME 156. COMBUSTION ENGINES.—A study of cycles, fuels, and fuel mixtures in piston, ram jet, and rocket engines. Comparison of real and theoretical cycles; carburetion and fuel injection systems; modern development. Prerequisite: ME 102. 3 s.h. Djordjević and Elsevier

ME 157. *PUMPS, COMPRESSORS AND TURBINES.—An introduction to the theory and design of centrifugal pumps and compressors, axial-flow compressors, impulse and reaction turbines, and gas turbine plants, combustion systems and regenerators. Concurrent: ME 102 and 106. 3 s.h. Boyle

ME 159-160. SENIOR MECHANICAL ENGINEERING LABORATORY.—Laboratory determination of heat flow and operating characteristics of engines, fans, pumps, and other power and refrigeration plant components; vibrational systems, control systems, analog methods. Student planning and reporting of original experiments. 2 s.h. Staff

ME 162. POWER PLANTS.—Basic concepts of thermodynamics, heat transfer and fluid flow are combined with industrial data for the consideration of real power plant problems. Selection of steam generators, prime movers, fans, pumps, heaters, and piping systems with regard to engineering and economic points of view. Prerequisite: ME 102. 3 s.h. Harman

ME 163. *VIBRATION CONTROL.—An introduction to the dynamics of mechanical systems; equilibrium, stability, lumped and distributed systems, cradle and field balancing. System analysis by classical differential equations, mechanical impedance, operational calculus and analog simulation. Prerequisite: Math 64, ME 141. 3 s.h. Buzzard

ME 164. *ENGINEERING ANALYSIS.—A study of a series of engineering problems with particular reference to mathematical and graphical methods of solution and engineering interpretations of results. Concurrent: Math 64. 3 s.h. Boyle

ME 166. *AIR CONDITIONING DESIGN.—Typical air conditioning systems considered in relation to specific problems. Equipment analysis and performance, economic considerations, system control and response, noise generation and attenuation. Prerequisite: ME 153. 3 s.h. Elsevier

ME 167. *INDUSTRIAL ENGINEERING.—A study of the organization and functioning of industries; function of engineering in industry; job analysis and self evaluation; professional and executive responsibility of the mechanical engineer. Prerequisite: senior standing. 3 s.h. Lewis

ME 168. *INDUSTRIAL ENGINEERING PRODUCTION METHODS.—Study of engineering theory, methods and controls in production. Methods, motion and time study, plant lay-out, production and quality control, industrial safety, operations research. Prerequisite: senior standing, ME 167 or equivalent. 3 s.h. Lewis

ME 171. RESPONSE OF PHYSICAL SYSTEMS.—An introduction to the basic fundamentals of instrumentation and of the control of processes and systems with emphasis on correlation of analysis and experimental results. Concurrent: Math 111. 3 s.h. Buzzard

ME 173-174. MECHANICAL ENGINEERING SEMINAR.—A course designed to keep the students abreast of progress in the engineering field and to develop their ability to express ideas effectively in speech and writing. Open to seniors only. 2 s.h. Staff

ME 182. *FUNDAMENTALS OF NUCLEAR ENGINEERING.—Review of nu-

* Offered only upon sufficient demand; enrollment limited.

clear physics, nuclear interactions and cross sections, neutron induced chain reactions, shielding, hazards, isotope utilizations, reactor systems, and power reactors. Prerequisite: permission of instructor. 3 s.h. KENYON

ME 197-198. PROJECTS IN MECHANICAL ENGINEERING.—This course may be assigned by the Chairman of the Department to outstanding seniors who express a desire for such work and who have shown aptitude for research in one distinct field of mechanical engineering. Prerequisite: 3.0 average and senior standing. 1-6 s.h. STAFF

Program of Studies in Mechanical Engineering for the Degree of Master of Science

Through the Graduate School of Arts and Sciences, the Department of Mechanical Engineering offers work leading to the degree of Master of Science. As a prerequisite to graduate study the student normally must have been awarded a Bachelor's degree in an accredited engineering curriculum. Minimum prerequisites to the graduate courses in mechanical engineering are a knowledge of differential equations, undergraduate thermodynamic theory, kinematics, mechanics, and machine design.

A minimum of 30 units of earned graduate credit is required for the M.S. degree: at least 12 units in the major subject area, a minimum of 6 units in related minor work outside of engineering, 6 units in either major or minor subject, and 6 units for a research-based thesis. There is no language requirement for the M.S. degree.

Graduate Courses

PROFESSOR KENYON, ACTING CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES; PROFESSORS KENYON, MACDUFF, AND MERIAM; ASSOCIATE PROFESSORS BOYLE, ELSEVIER, AND PEARSALL; ASSISTANT PROFESSORS BUZZARD AND HARMAN

ME 201. *THEORETICAL AND APPLIED MECHANICS.—Introduction to the theory of elasticity, and vibration analysis. 3 units. MERIAM

ME 202. *THEORETICAL THERMODYNAMICS.—Classical thermodynamics based on the First, Second, and Third Laws of Thermodynamics. Classical and statistical thermodynamics of ideal gases. Properties of real gases, equilibrium, combustion, and irreversible processes. 3 units. HARMAN

ME 221. *ANALYSIS OF COMPRESSIBLE FLUID FLOW.—Flow of compressible fluids; concepts of subsonic, sonic, and supersonic flow; experimental methods. 3 units. HARMAN

ME 222. *ANALYSIS OF HEAT TRANSFER.—Heat transfer by conduction, convection, and radiation; lumped and distributed heat capacity, resistance, losses; steady and transient flow. 3 units. KENYON

ME 231-232. *SYSTEMS ENGINEERING.—Methods of obtaining parameters for strength, response, and stability studies of mechanical systems. Impedance and operational means of analysis; mechanical and electronic analogs; nonlinear theories. 6 units. MACDUFF

* Offered only upon sufficient demand; enrollment limited.

ME 265. *ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite; approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 units. Members of the Graduate Staff

ME 280. *NUCLEAR REACTOR POWER CYCLES.—Introduction to basic reactor principles and reactor types. Consideration of thermodynamic cycles for nuclear reactors for stationary and mobile plants. Analysis of fluid flow and heat transfer problems unique to reactors with development of methods of reactor safety techniques. Metallurgical problems peculiar to reactor design. 3 units. Kenyon

ME 297, 298. THESIS RESEARCH.—A student with proper background may carry on research under the direction of the staff in one of the following fields: systems engineering; thermodynamics; heat transfer; and fluid flow. Thesis credit only. 6 units. Members of the Graduate Staff

* Offered only upon sufficient demand; enrollment limited.

Subjects Common to All Curricula

Interdepartmental Engineering Subjects

ENGRG. 1. ENGINEERING DESIGN I.—An introduction to engineering design, including the language of graphics, the rules of orthographic projection, and drafting techniques. Most of the drawing is done in pencil, both freehand and with instruments. Short design problems are assigned to individuals or to small groups. 2 s.h. HAINES, LEWIS, AND STAFF

ENGRG. 2. ENGINEERING DESIGN II.—Continuation of graphical representation as applied to drawing board geometry. Problems involving intersections and development of surfaces and the relationship of lines and planes. Solutions are derived through application of orthographic principles acquired the first semester. Mathematical problems, charts, graphs, elementary nomography, graphical calculus, and other special problems. Problems are larger in scope than those in the first semester and require more realistic budgets and closer attention to ultimate feasibility. Prerequisite: Engrg. 1. 2 s.h. HAINES, LEWIS, AND STAFF

ENGRG. 57. STATICS.—A study of force systems, equilibrium by algebraic and graphic methods, friction, centroids, moments of inertia. Prerequisite: Engrg. 1; concurrent: Math. 63 and Physics 41. 3 s.h. ARGES

ENGRG. 60. ENGINEERING MECHANICS.—A study of statics and dynamics, as applied to particles and rigid bodies. Fundamentals are developed using vector and scalar values. Concurrent: Phys. 41 and Math. 63. 4 s.h.
ARGES, BARTON, AND WOOD

ENGRG. 107. MECHANICS OF MATERIALS.—Stresses and strains in elastic bodies; shear and moment diagrams; stresses in beams; beam deflections by double integration and area-moments; statically indeterminate beams, torsion, principal stresses. Prerequisite: Engrg. 57 or Engrg. 60; concurrent: Math. 64. 3 s.h.
ARGES AND PALMER

ENGRG. 109. MECHANICS OF MATERIALS LABORATORY.—Study and use of testing machines and strain gages; tests to determine significant mechanical properties of the common engineering materials; experimental verification of the elementary theory of structural members. Concurrent: Engrg. 107. 1 s.h.
BARTON AND SHEPPARD

ENGRG. 115. DYNAMICS.—General principles of dynamics as applied to particles and rigid bodies. Translation, rotation, general plane motion, work and energy, impulse and momentum, gyroscopic motion. Prerequisite: Engrg. 57; concurrent: Math. 64. WOOD

ENGRG. 128. FLUID MECHANICS.—Physical properties of fluids, fluid statics, continuity and energy principles, pressure-momentum principle, elementary principles of turbines and pumps, flow of a real fluid, dimensional analysis and dynamic similarity, fluid flow in closed conduits and in open channels; fluid measurements. Prerequisite: Engrg. 60, or concurrent: Engrg. 115; prerequisite: Math. 64. 3 s.h.
HARRAWOOD AND KUMAR

ENGRG. 153. *ARCHITECTURAL ENGINEERING.—The application of engineering principles to architecture; the influence of engineering function and trends on design; the interrelationship of engineering with architecture; the analysis of structural details and of processes of construction; field trips and inspection of construction projects. Prerequisite: permission of instructor. 3 s.h. HAINES

* Offered only upon sufficient demand; enrollment limited.

ENGRG. 169. *LEGAL ASPECTS OF ENGINEERING.—A course designed to introduce engineering students to those aspects of the law encountered in the practice of engineering. Subjects included are: contracts and specifications, real and personal property, torts, insurance, agency, equity, evidence, labor management, sales, expert testimony, engineering registration and ethics. Open to seniors only. 3 s.h. Olive

ENGRG. 170. *PATENT LAW FOR ENGINEERS.—A course designed to familiarize engineering students with the legal principles and procedures for protecting patentable inventions, such as drafting and analysis of specifications and claims, study of infringements, assignments, licenses, and record documentation. Open to seniors only. 3 s.h. Olive

Non-Engineering Subjects in Curricula

CHEM. 1, 2. GENERAL INORGANIC CHEMISTRY.—Lectures and recitations on the elementary principles of chemistry and on the structure, properties, preparation and uses of the elements and their compounds. The laboratory work includes qualitative analysis of some of the more common metals. One lecture, two recitations, and three laboratory hours, throughout the year. Chemistry 1 is a prerequisite for Chemistry 2. Prerequisite: Qualification for Math 21. 8 s.h.

ECON. 51. PRINCIPLES OF ECONOMICS.—Examination of the main features of the American economy, measurement of national income, and analysis of forces determining national output and income; fluctuation and growth of output, monetary and fiscal policies for stability and growth. 3 s.h.

ECON. 52. PRINCIPLES OF ECONOMICS.—Examination of forces determining prices and production of goods, distribution of income; problems of agriculture, labor, international trade, economic development, and government in relation to business. 3 s.h.

ENGL. 1-2. FRESHMAN COMPOSITION.—Training in composition through the writing of weekly expository themes. The theme subjects derive from assigned reading drawn from British and American literature of the Twentieth Century. English 1 takes up the Essay, the Short Story, and the Novel; English 2, the Play and the Poem. The student attends each week (1) a general lecture on the reading for the week; (2) a section meeting, where the instructor and a small group discuss problems of composition and literature; and (3) an individual conference in which the instructor reads and grades the weekly theme and makes special assignments according to the needs of the student. 6 s.h.

ENGL. 93. TECHNICAL COMMUNICATION.—Emphasis will be placed on the writing of business letters, technical reports, and articles for submission to technical journals. Approximately one-third of the course will provide training in the oral presentation of various materials. Prerequisite: English 1 and 2. 3 s.h.

HIST. 1, 2. MODERN HISTORY.—With special reference to the issues in the modern world. Topics selected for emphasis: the contest between liberty and authority in the modern state; changing economic organization and theory—capitalism and the challenges to it; the problems of peace and war among the states; the changing faiths men live and die by. Beginning about 1500 with the rise of the European dynastic states, the story is pursued in the first semester to approximately 1848, and in the second through the two great world wars. The central theme in both semesters is the expansion of the influence of Western Europe throughout the world, with some attention to the rise of the United States as a world power. 6 s.h.

Sophomores and juniors are not admitted to this course.

HIST. 3. MODERN TECHNOLOGY.—An introduction to the history of modern Western technology, with special emphasis on the nineteenth and twentieth

* Offered only upon sufficient demand; enrollment limited.

centuries. Technological development will be related to the political, economic, and scientific trends discussed in Hist. 1-2. 3 s.h.

MATH. 21, 22. INTRODUCTORY CALCULUS.—Real and complex numbers, rectangular and polar coordinates, graphs, trigonometric and inverse trigonometric functions, logarithmic and exponential functions, conic sections, limits, derivatives, maxima and minima, methods of integration, areas, volumes. Prerequisite: two and one-half units of college preparatory mathematics. Math. 21 is prerequisite for Math. 22. 6 s.h.

MATH. 63, 64. INTERMEDIATE CALCULUS.—Moments, centroids, indeterminate forms. Taylor's formula, approximation of integrals, improper integrals, infinite series, vectors and solid analytic geometry, partial derivatives, multiple integrals, introduction to ordinary differential equations. Prerequisite: Math. 22 for 63; and 63 for 64. 6 s.h.

MATH. 111. APPLIED MATHEMATICAL ANALYSIS I.—Ordinary and partial linear differential equations with constant coefficients, Fourier series and their applications, vectors. Not open to students who have had Math. 131. Prerequisite: Math. 64. 3 s.h.

MATH. 112. APPLIED MATHEMATICAL ANALYSIS II.—Complex variables, residues, conformal mapping, matrices, Laplace and Fourier Transforms and their applications. Prerequisite: Math. 64. 3 s.h.

PHYS. 41-42. GENERAL PHYSICS.—Treats the basic principles of general physics in a more quantitative manner than Physics 1-2. Not open for credit to students who have taken Physics 1-2. Three lecture-recitations and one three-hour laboratory period each week. Concurrent: Math. 21-22. 8 s.h.

PHYS. 161, 162. MODERN PHYSICS.—Review of electromagnetic fields, relativity, quantum phenomena, atomic and molecular spectra, solids, and the nuclear physics. Three lectures per week. Prerequisite: Physics 41-42, Math. 22. Physics 161 is prerequisite for 162. 6 s.h.

For additional non-engineering courses consult the *Bulletin of Undergraduate Instruction*.

Recommended Minor Subjects for Graduate Students

CHEM. 206. ELEMENTS OF THEORETICAL CHEMISTRY.—A course in the general principles of physical chemistry for students who do not present credit in calculus. Credit is not given for both 206 and 261-262. Three recitations and three laboratory hours. Prerequisites: quantitative analysis, organic chemistry 8 units; physics 8 units, and mathematics 6 units. With the permission of the Director of Graduate Studies, graduate students from other departments may offer other advanced science courses in lieu of some of these prerequisites. 4 units.

CHEM. 261-262. PHYSICAL CHEMISTRY.—Fundamentals of general theoretical chemistry illustrated by selected laboratory experiments. Three recitations and three laboratory hours. Prerequisites: quantitative analysis, organic chemistry 8 units; physics 8 units, differential and integral calculus. 8 units.

MATH. 221. DIGITAL COMPUTER.—History of computers; number representation, information, storage, logical arithmetic; components and organization of computing systems; coding and programming; programmed arithmetics, function and functional subroutines, interpretive routines, compilers; error analysis. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. The fee is payable to the Treasurer's Office of Duke University at the beginning of the semester. 3 units.

MATH. 222. INTRODUCTION TO NUMERICAL ANALYSIS.—Error analysis, real and complex roots of equations, finite difference methods and theory of interpolation, numerical differentiation and integration, numerical integration of ordinary and partial differential equations, simultaneous equations and matrix inversion. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. The fee is payable to the Treasurer's Office of Duke University at the beginning of the semester. Prerequisite: Math. 221. 3 units.

MATH. 283. PROBABILITY FOR ENGINEERS.—Basic probability concepts, sample space, discrete and continuous events, permutations and combinations, conditional and marginal probability, discrete and continuous distributions, expected values and moments, sampling distributions, estimations, hypothesis testing. Prerequisite: calculus. 3 units.

MATH. 285. APPLIED MATHEMATICAL METHODS I.—Vectors, line and surface integrals, tensors, complex variables, differential and integral equations. Prerequisite: Math. 53. 3 units.

MATH. 286. APPLIED MATHEMATICAL METHODS II.—Wave equation, Fourier series, heat equations, telegraphic equation, Legendre polynomials, Bessel functions. Schrödinger's equation. Prerequisite: Math. 53. 3 units.

MATH. 290. APPLICATIONS OF STOCHASTIC PROCESSES.—Recurrent events, random walk, Markov chains and processes, queueing theory, branching and diffusion processes, Gaussian processes. Prerequisite: Math. 136 or 283. 3 units.

MATH. 291-292. THEORY OF FUNCTIONS.—Limits, implicit functions, power series, double series, Cauchy's theorem and its applications, residues, Riemann surfaces, conformal mapping. Prerequisite: calculus. 6 units.

PHYS. 201, 202. MECHANICS.—The fundamental principles of Newtonian mechanics, general dynamics of systems of particles and rigid bodies, the methods of Lagrange and Hamilton; generalized mechanics. Prerequisite: Phys. 125. 6 units.

PHYS. 213, 214. CONTEMPORARY PHYSICS.—A course which covers the fundamental concepts and the experimental basis of modern physics. Three lectures each week. 6 units.

PHYS. 219. ELECTRICITY AND MAGNETISM.—Fundamentals of electricity and magnetism. Physical optics. Electromagnetic waves. 3 units.

PHYS. 221, 222. THEORETICAL PHYSICS.—Mechanics of particles and of rigid bodies, elasticity, fluids dynamics, electrodynamics, optics, relativity, thermodynamics, statistical mechanics, wave mechanics. Prerequisite: Math. 285, 286 or equivalent to be taken at least concurrently. 6 s.h.

PHYS. 318-319. ELECTROMAGNETIC FIELD THEORY.—Electrostatics and potential theory, dielectric and magnetic media, the magnetic field of currents and the law of induction. Maxwell's electrodynamics, theory of wave optics, refraction, interference and diffraction, relativity. Prerequisite: Phys. 219. 6 units.

PHYS. 331. MICROWAVE RADIATION.—Microwave generators, cavity resonators, transmission lines, radiation propagation and detection. 3 units.

For additional courses consult the *Bulletin of The Graduate School of Arts and Sciences.*

Reserve Officers Training Corps

THROUGH the Naval and Air Force Reserve Officers Training programs the University is cooperating with the Department of Defense in the effort to provide a steady supply of well-educated officers for the active and reserve forces of the nation.

The Naval Reserve Officers Training Corps

There are two basic programs through which students can qualify for Naval commissions upon graduation: one, the Regular Naval Reserve Officers Training Corps program, provides a maximum of four years in the University largely at government expense, followed by a commission in the regular Navy or Marine Corps; the other, the Contract program, leads to a commission in the Naval Reserve or the U. S. Marine Corps Reserve. Additional information may be found in the *Bulletin of Undergraduate Instruction.*

The Air Force Reserve Officers Training Corps

The unit functions as a regular department of instruction known as the Department of Aerospace Studies. It selects and trains students who possess the requisite character, intelligence, desire, and sense of duty to become Air Force officers. Additional information may be found in the *Bulletin of Undergraduate Instruction.*

Financial Information, Living and Dining Accommodations

FEES paid by the students cover only a part of the cost of their instruction and of the operations of the University. Income from endowment and contributions from the alumni, alumnae, and other public-spirited men and women meet the balance, which constitutes more than half the total cost.

Estimated Expenses for an Academic Year

Certain basic expenditures are to be considered in preparing a student's budget, such as tuition, the general fee, room, and board. The necessary expenditures together with a reasonable amount allotted for miscellaneous items such as laundry, organizational dues, and sundry purchases shown as follows:

	Undergraduate Men		*Undergraduate Women*	
Tuition	$1,250.00		$1,250.00	
General Fee	187.00		187.00	
Room Rent	250.00		275.00	
Board	575.00	(Cafeteria estimate)	450.00	(Board Rate)
Books and Supplies	70.00		70.00	
Miscellaneous Expenses	443.00	(Moderate estimate)	443.00	(Moderate estimate)
Estimated Totals	$2,775.00		$2,675.00	

Miscellaneous expenses beyond the moderate estimate given above depend to a large extent upon the tastes and habits of the individual. It is realistic to suggest that the average Duke student, however, can plan on a budget of $2800.00 for the academic year. Travel costs, clothing purchases, and other major personal expenditures would have to be added to this estimate.

Undergraduate Tuition and Fees

The semester tuition of $625.00 and general fee of $93.50 are due and payable not later than the day of registration for a particular semester. After the day of registration no refund of the tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

New students, on notification of acceptance, are required to pay a non-refundable first registration fee of $20.00 and to make a deposit of $50.00. The $50.00 deposit will not be refunded to accepted applicants who fail to matriculate. For those who do matriculate $25.00 of the deposit serves as a continuing room deposit for successive semesters, and the remaining $25.00 as a continuing pre-registration deposit, which at the time of pre-registration will reserve a place in classes for the following semester. Arrangements for refund of the $25.00 room deposit are described in information furnished each resident student by the Housing Bureau. The $25.00 pre-registration deposit will be refunded to students (1) whom the University does not permit to return, (2) who graduate, or (3) who request the refund at the time of pre-registration, thus indicating their intention not to return for the following semester. The pre-registration deposit will not be refunded to students who pre-register and fail to enter the following semester on schedule.

Students who have been re-admitted to the University after an absence of one or more semesters, on notification of re-admission, are required to make the $50.00 room and registration deposits.

An Air Force ROTC deposit of $20.00 is required of students enrolling in Aerospace Studies to cover possible loss of military equipment issued to them. This deposit is refunded to the student upon return of issued equipment.

In the regular academic year students who register for no more than two courses with a maximum credit of 8 semester hours are classified as special students. They are charged a registration fee of $5.00 for each course and $42.00 for each semester hour of course credit. Registration for 9 or more semester hours, or 3 or more courses, requires payment of full fees.

Auditing of one or more courses without charge is allowed students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for not less than 3 nor more than 8 semester hours may audit other courses by payment of $21.00 for each course audited. Auditors submit no daily work, take no examinations, and receive no credit for courses audited.

One transcript is issued free of charge. Additional copies are supplied at $1.00 each.

No records are released and no student is considered by the faculty as a candidate for graduation until he has settled with the Treasurer for all indebtedness.

Bills may be sent to parents or guardians provided the Treasurer has been requested in writing to do so. Failure to pay bills on or before the due dates will debar the student from class attendance until the account is settled in full.

Financial Aid

Duke University is interested in students with ability and ambition, hence it is the aim of the University to provide, insofar as possible, the financial assistance required by worthy students. This assistance takes various forms.

Scholarships and prizes enable students with inadequate resources to reduce the amount payable to the University. Loans are made available. Through the Student Employment Offices part-time jobs are arranged. Through the Financial Aid Program an earnest effort is made to eliminate the economic status of the student as a criterion for admission.

The actual cost to the University for each student is more than twice the amount received from the student. The deficit is paid out of the contributions and income from endowment.

Undergraduate Engineering Scholarships, Loans, and Student Employment

ENGINEERING SCHOLARSHIP FUND
Established by gifts of various persons; to be used for scholarship aid to engineering students.

THOMAS R. MULLEN, JR., SCHOLASTIC FUND
Established April 5, 1949, by gift of T. R. Mullen in memory of his son; the income to be used for scholarship assistance to students in the College of Engineering. Preference is to be given students who are children of employees of the Lehigh Structural Steel Company or others nominated by the Company. One award is available each year.

JONES SCHOLARSHIP FUND
Established in 1951 by Edwin L. Jones, Sr., '12; Annabel Lambeth Jones, '12; Edwin L. Jones, Jr., '48; Lucille Finch Jones; and the J. A. Jones Construction Company in memory of James Addison Jones and Raymond A. Jones; a portion of the income to be used for scholarship aid to worthy and qualified students in the College of Engineering.

ALCOA SCHOLARSHIP IN ENGINEERING
Established in 1962 by the Alcoa Foundation. One award of $625.00 per year is made to a student preparing for a career in either electrical or mechanical engineering.

WESTERN ELECTRIC FUND SCHOLARSHIP
Established in 1957 by gift of the Western Electric Fund; a scholarship in the amount of $800.00 is given annually to an outstanding student in the field of electrical engineering who has completed the sophomore year of study.

UNION BAG-CAMP CORPORATION SCHOLARSHIP
Established in 1957 by gift of the Union Bag-Camp Corporation to provide a scholarship of $600.00 to a student in the fields of chemistry or mechanical engineering in alternate years.

Duke University participates in several other industry scholarship programs. Several of these awards for which freshmen may apply are

assigned to engineering students annually although they are not restricted to students in this field of study. Among the available awards are the General Motors Scholarships and the Texas Company Scholarships.

Students who wish additional detailed information about these awards and other scholarship, loan, or employment opportunities should refer to the *Bulletin of Undergraduate Instruction* or write to the Office of Admissions, Duke University, Durham, North Carolina, 27706.

Graduate Tuition and Fees

The following table shows the general fees and charges collected from all graduate students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration for that semester. No student is admitted to classes until arrangements have been made with the Bursar of the University for the settlement of fees.

Tuition and general fees* ($40.00 per unit)	$600.00
Athletic Fee, not including federal tax, optional, per year, payable in the fall semester	15.00
Room rent (See detailed statement, p. 48.)	
Fee for Microfilming, payable by candidates for a doctoral degree when the dissertation is presented to the Graduate Office after the final examination	25.00

* General fees, in lieu of most special charges, include the following fees: Matriculation, Medical, Library, Damage, Commencement, Diploma, and an average of the Laboratory and Materials Fees.

Tuition and fees for a full semester program of 15 units amount to $600.00. For a part program, tuition and fees are computed at the rate of $40.00 per unit.

SPECIAL FEES FOR TEACHERS AND OTHERS: The Graduate School recognizes a special obligation to encourage the following types of students in their professional and personal advancement: (1) members of the faculties of the neighboring public schools and colleges, currently engaged in *full-time* teaching while taking courses in the Graduate School, (2) ministers of neighboring churches, (3) wives of Duke faculty members, (4) *full-time* employees of Duke University who are paid on a monthly basis throughout the year. The reduced fees do not apply to teachers and ministers while on leave of absence, nor to holders of fellowships, scholarships, or graduate and research assistantships, nor to part-time instructors.

Persons eligible for the reduced fee must meet the admission standards required of all graduate students and must be admitted to the Graduate School. They may enroll for one or two courses per semester (in no case totaling more than 7 units) upon the payment of a fee of

$5.00 for registration for each semester and a tuition fee of $15.00 per unit of credit or an audit fee of $15.00 per course.

STIPENDS and INCOME TAX: Ordinarily stipends awarded under fellowships and scholarships are not subject to income tax and Social Security Tax. However, a portion of the award to graduate assistants may be subject to tax. The Graduate Office will supply detailed information.

Graduate Assistance

Each of the three Departments of Engineering makes available to qualified graduate students a number of teaching internships, part-time instructorships, and research assistantships, each of which permits the holder to carry three-fifths of a normal load of graduate courses. For further information concerning these positions, write to the Associate Dean for Graduate Study and Research, College of Engineering, Duke University, Durham, North Carolina, 27706.

SHELL FELLOWSHIP IN ELECTRICAL ENGINEERING. This fellowship is established to encourage graduate studies leading to an M.S. or Ph.D. degree in electrical engineering. Preferential consideration is given to candidates in an advanced stage of their work toward the doctorate. This award provides for a single student or a childless married student a stipend of $2,000 per academic year, or $2,500 per 12 consecutive months of study; or for a married student with one or more children, a stipend of $2,600 per academic year, or $3,200 per 12 consecutive months of study. In addition, the Fellowship provides actual tuition and fees required of the recipient and a special allotment of $1,000 to the major department to be applied toward equipment and materials needed by the Fellow in his research. Appointment is for one year with the possibility of reappointment.

NATIONAL SCIENCE FOUNDATION TRAINEESHIPS. Traineeships for graduate study leading to the Master of Science and Doctor of Philosophy degrees are available as part of a nationwide program sponsored by the National Science Foundation. They will be available in the Departments of Civil Engineering and Electrical Engineering and will permit specialization in those areas of study. The Traineeships will provide full tuition plus 12-month stipends of $2,400 for a student starting graduate study, $2,700 for an intermediate-level student, and $2,800 for a student at the terminal level. A 12-month allowance of $500 per dependent (spouse or child) will also be provided. Nine-month awards may be made in three-fourths of the above amounts. The Traineeships are intended to permit full-time study, and trainees will be encouraged to choose twelve months'

tenure. Under certain conditions the Traineeships may be renewed for up to four years.

Inquiries and applications pertaining to fellowships and traineeships should be addressed to the Associate Dean for Graduate Study and Research, College of Engineering.

For the encouragement and financial assistance of graduate students of marked ability, the University also has established a considerable number of general fellowships. For information concerning these fellowships, write to the Dean of the Graduate School, Duke University, Durham, North Carolina, 27706.

Living Accommodations

Undergraduate students are required to live in the residence houses unless they are married or are living with parents or relatives. Any exception must be approved by the Dean. Rooms are rented for the academic year but for no period of less than one semester. No refund will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

In the residence houses for undergraduate, graduate, and professional men, the rental charge for a single room is $300.00 for the academic year or $150.00 for each semester. The rental charge for a double room is $500.00 for the academic year or $250.00 for each occupant, or $125.00 per semester for each occupant.

In the residence houses for undergraduate, graduate and professional women on the Woman's College Campus, the rental charge for a single room is $325.00 for the academic year or $162.50 for each semester. The rental charge for a double room is $550.00 for the academic year or $275.00 for each occupant, or $137.50 per semester for each occupant.

Regulations governing the occupancy of rooms will be supplied directly from the Housing Bureau when the reservations are made. Occupants are expected to abide by these regulations.

For details concerning living accommodations, see the *Bulletin of Undergraduate Instruction or the Bulletin of the Graduate School of Arts and Sciences.*

Dining Service

On the West Campus, dining facilities in the Union include three cafeterias with multiple-choice menus, and the Oak Room where full meals and *a la carte* items are served. The cost for the academic year ranges from $500.00 upward, depending on the tastes of the

individual. In the Men's Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge, where sodas and sandwiches are served. In both West Campus facilities the meals are served on a pay-as-you-go basis.

On the East Campus dining halls are located in the Woman's College Union and in Gilbert-Addoms Dormitory. Resident women take their meals in these halls. The charge for board is $225.00 per semester, payable at the time of registration. There will be no board refund for withdrawal after six weeks from the beginning of class; a refund will be made on a pro rata basis for withdrawals occurring during the first six weeks.

Due to the large number of those served in the dining halls, it is not possible to arrange special diets for individual students.

The Counseling Center



THE University maintains a counseling center which provides educational, vocational, and personal counseling for students. The Center is the administrative agency for most of the national testing programs, including admissions tests for graduate and professional schools. A library of information on occupations, graduate training, and fellowships for graduate study is maintained.

The counseling and information services of the Center are free to Duke students. Additional information on the counseling, testing, and information services may be secured from the Duke University Counseling Center, 309 Flowers Building, Duke University, Durham, North Carolina, 27706.

Employment Opportunities

THE APPOINTMENTS OFFICE is a service agency designed to aid students and alumni in obtaining both summer and post-college employment. Its primary function is to serve as an intermediary between students, alumni, and prospective employers. It directs attention to possibilities in business and professional fields, it assembles comprehensive records on each registrant and makes these records available to appropriate representatives, and it arranges interviews with prospective employers. The Office initiates contacts for students or cooperates with students who make contacts through personal efforts or through various departments of the University. It aids the registrant in directing his search to a field appropriate to his aptitude, training, and interest.

There are two major divisions of the Office: the Commercial Division, which handles all matters involving contacts with business and professional areas not related to formal education; and the Educational Division, which concerns itself with teaching and school administration positions at all levels. Seniors, graduate students, and alumni may register with either or both of these divisions.

The Office receives more calls for qualified personnel than it can supply from its registrants. It is to the mutual advantage of the students and the Office that a complete record of registrants be assembled by the fall of the senior year or, in the case of graduate students, by the fall preceding the year during which they will seek employment.

Undergraduate Registration and Academic Regulations

Enrollment and Registration

STUDENTS in residence are required to submit to the Dean of the College, not later than the date of the spring registration, cards showing their selection of courses for the following year. Evidence of the payment of the continuing pre-registration deposit of $25.00 is required before the card may be submitted. These cards are filed for permanent record in the Central Records Office. Students who do not select their courses for the following year at the time appointed must be readmitted to the College by reapplication to the Director of Admissions. Students whose course cards have been approved in the spring may enroll by mail during the summer. The same regulations, with the exception of the advance deposit, apply to registration for the spring semester.

Students who register in either semester at a date later than that prescribed in the calendar of this Bulletin must pay to the Treasurer a fee of $5.00. (See attendance regulations, page 56.) Changes in courses for reasons not arising within the University require a payment of $1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted late to any class without an enrollment card.

General Undergraduate Academic Regulations

QUANTITY CREDIT AND COURSE LOAD: The unit of credit used in the semester hour, which signifies one class period a week throughout the semester. Two or three hours of laboratory work are equivalent to one hour of class work. Two semesters of 17 weeks each constitute the academic year. For the degree of Bachelor of Science in Engineering, credit for a minimum of 142 semester hours is required*

In engineering the normal load is 16-19 semester hours, exclusive of physical education. No student is permitted to take less than 14 semester hours of work without special permission from the Dean of to take more than the normal load of work unless his average grade in the preceding semester is higher than C.

* Beginning with the freshman class that matriculates in September 1965 a minimum of 134 semester hours will be required.

QUALITY CREDIT: The requirements for the degree are computed in semester hours and in quality points. Quality points are earned by a student on the basis of his grades: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points.

†REQUIREMENTS FOR CONTINUATION IN COLLEGE AND FOR GRADUATION: To continue in college and to graduate, a student must, in addition to the requirements listed elsewhere in this Bulletin, pass a minimum number of semester hours and achieve a specified quality point ratio. The quality point ratio is based solely on work performed at Duke and is calculated by dividing the total number of quality points earned by the total number of semester hours attempted at Duke. These requirements are listed in the following table:

For continuation from	*The minimum requirement is*
The first to the second year	18 s.h. credit and a q.p.r. of 1.30
The second to the third year	48 s.h. credit and a q.p.r. of 1.60
The third to the fourth year	78 s.h. credit and a q.p.r. of 1.70
The fourth to fifth year, if needed	108 s.h. credit and a q.p.r. of 1.80

For graduation the minimum requirement is,

142 s.h., a q.p.r. of 1.90
and a q.p.r. of 2.00 in senior work*

* A minimum average grade of C in all courses taken in the last year, combined with all courses designated for the senior year in the particular engineering curriculum.

REPORTS: Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, six-weeks advisory grade reports on freshmen are mailed at each mid-semester period.

DISMISSAL: In addition to the qualitative standards listed above, students must pass a minimum number of hours each semester. Freshmen must pass at least 6 semester hours of work in their first semester, 3 required courses in their second semester, and 18 semester hours in their first year; all other students must pass at least 9 semester hours each semester. Physical education credits are excluded in each case. The University may require a student whose record is considered unsatisfactory to withdraw although he has met the minimum requirements set forth in this paragraph.

†ACADEMIC CLASS STANDING: *To be classified as a sophomore,* a student must have to his credit at least 22 semester hours and must have passed certain specially designated courses of the freshman

†All engineering curricula are undergoing thorough re-study and re-evaluation; hence, certain requirements may be subject to modification beginning with the academic year 1965-66.

engineering curriculum. *To be classified as a junior,* he must have to his credit at least 62 semester hours and must have passed certain specially designated courses of the sophomore departmental engineering curriculum. *To be classified as a senior,* he must have to his credit at least 102 semester hours and must have passed certain specially designated courses of the junior departmental engineering curriculum.

RESIDENCE REQUIREMENT: A minimum of 60 semester hours, including 30 semester hours from those hours normally taken during the senior year, must be earned in residence.

Grading, Examinations, and Attendance

GRADING: Final grades are reported to indicate passing or failing work in designated courses. Final grades are:

(1) *Passing.* Passing grades are A, exceptional; B, superior; C. average; and D, low pass.

(2) *Failing.* A grade of F indicates that the student has failed the courses and to receive credit for the course he must repeat the work in class.

Special symbols are used to indicate the following:

(1) *Absence from the final examination.* In all cases in which the student is absent from a final examination, he receives an X in place of a final grade. If he does not present an acceptable explanation for his absence to the Dean's office within 48 hours after the scheduled time for the examination, the X is converted to an F. A student absent from examination, if the absence has been excused by the Dean, may receive an examination upon payment of a fee of $5.00 to the Treasurer of the University. The instructor concerned arranges for the examination in cases where absences are excused. An X not cleared by the end of the semester following the examination missed is converted to an F.

(2) *Incomplete work.* If because of illness or other emergency a student's work in a course is incomplete, he may receive an I for the course instead of a final grade. Incomplete courses must be completed before the close of the succeeding semester; otherwise, the I is converted to an F and the course must be repeated in class if the student is to receive credit for it. In case a student whose work is incomplete is also absent from a final examination, he receives an X for the course.

(3) *Withdrawal.* The letter W is used to indicate official withdrawal from a course. If a student drops a course without permission from the Dean, the grade for that course is recorded as F. If he drops

with permission a course in which he is failing, the grade for that course is recorded as F unless, in the judgment of the Dean, circumstances do not justify this penalty.

EXAMINATIONS: Final examinations are held in all subjects in January and May.

ATTENDANCE REGULATIONS: The attendance regulations specifically place the responsibility for class attendance upon the individual student. A student is expected to attend his classes regularly and punctually. It should be recognized that one of the most vital aspects of a residential college experience is attendance in the classroom, and that the value of this academic experience cannot be fully measured by testing procedures alone. The members of the student body are considered sufficiently mature to appreciate the necessity of regular attendance, to accept this personal responsibility, and to demonstrate the kind of self-discipline essential for such performance; and, conversely, to recognize and accept the consequences of failure to attend. Instructors are privileged to refer to the dean for appropriate action any student who in their opinion is causing his work or that of the class to suffer because of absences or latenesses.

Absences from required classes due to illness will be excused when certified by a proper medical official. Absences from required classes due to authorized representation of the University may be excused. Officials in charge of groups representing the University are required to submit names of those persons to be excused to the appropriate dean's office 48 hours in advance of the hour when their absences are to commence. Excuses are issued by the Office of the Dean of the College.

Graduate Registration and Academic Regulations

WHO MUST REGISTER: (1) All students who enter course work or residence for credit; (2) all students who have completed minimum requirements for an advanced degree, but continue to use the facilities of the University in their research; (3) all students in *in absentia* status; (4) all students who wish merely to audit a course or courses.

REGISTRATION: After the applicant has received notification of his admission to the Graduate School and has returned his statement of acceptance of admission, he may present himself for registration. During the registration periods, announced in the *Bulletin,* he first confers with the Director of Graduate Studies of his major department, who prepares and signs a course card, listing the course work to be taken during the semester. The student then presents this course card to registration officials, who enroll him officially in his courses. After his first registration period as a current student he will pre-register at the stated times for pre-registration. Failure to pre-register incurs the penalty for late registration. *Former students* who intend to register to resume a degree program must give the Department and the Dean notice of this intention two months before registration.

LATE REGISTRATION: All students are expected to register or pre-register at the time stated in the *Bulletin.* Those registering late are subject to a *late registration fee of five dollars.*

CHANGE OF REGISTRATION: During the academic year within a period of *fourteen days* from the registration date students may change registration with the approval of the Director of Graduate Studies, if no reduction of fee is involved, and with the approval of the Dean if reduction of fee is involved. Thereafter during the first thirty days from the registration date the only permissible change is dropping course-seminar registration and adding equivalent units of research, with the approval of the Director of Graduate Studies, the instructor of the course, and the Dean.

General Graduate Academic Regulations

CREDITS. Although ideally graduate study is principally individual reading, research, and laboratory experimentation under guid-

ance, academic progress in the United States is generally measured and recorded in terms of course hours and credits. Peculiar to graduate study is the term *residence,* also generally measured in hours, to designate individual study apart from courses, such as writing a thesis and preparing for general examinations. In this Graduate School credit for courses and seminars, research, and residence, and corresponding tuition and fees has been stated in terms of UNITS. According to conventional measurement ONE UNIT is equivalent to ONE SEMESTER HOUR.

CREDITS EARNED OUTSIDE THIS GRADUATE SCHOOL

(1) *Graduate Credit Earned before the Bachelor's Degree Is Granted.* Ordinarily no credit will be allowed for graduate courses earned before a student has been awarded his A.B. or B.S. degree. However, an undergraduate student at Duke University who, at the beginning of his final semester, lacks no more than 9 semester hours of fulfilling the requirements for the A.B. or B.S. degree, may obtain permission from the Dean of the Graduate School to enroll for graduate courses sufficient to bring his total program to 15 semester hours a week. Such graduate courses will be credited toward the M.S. degree, provided that the student meets the requirements for admission to the Graduate School, and that he is duly registered in the Graduate School at the beginning of that term.

(2) *Transfer of Graduate Credits.* Credit for graduate course work earned at another institution will be determined only after a student has spent one semester at Duke University. After completing his first semester, the student, through his Director of Graduate Studies, should file a request that his credits be reviewed and a decision made.

(3) *Reciprocal Agreement with the Consolidated University of North Carolina.* Under a plan of co-operation between the Consolidated University of North Carolina and Duke University, students regularly enrolled in the Graduate Schools of the Consolidated University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester in the Graduate School of Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students in the Graduate School of Duke University may be admitted to course work at the Consolidated University of North Carolina. On an experimental basis, a similar arrangement is in effect in the Summer Session. See *Summer Session Bulletin* for terms of this arrangement.

GRADES. Grades in the Graduate School are as follows: *E, G, S, F,* and *I. E* (exceptional) is the highest mark. *G* (good) and *S*

(satisfactory) are the remaining passing marks. *F* (failing) is below passing, and *I* (incomplete) indicates that some portion of the student's work is lacking, for a satisfactory reason, at the time the grades are reported. The instructor who gives an *I* for a course specifies the date by which the student must have made up the deficiency. In no case may an extension be granted beyond one calendar year from the date the course ended. If the course is not completed, the grade of *F* is entered upon the student's record unless his appeal to the Dean for the grade of *no credit* is approved. The grade of Z indicates satisfactory progress at the end of the first semester of a two-semester course. It will be changed to whatever grade is appropriate upon the completion of the course. A grade of *F* in a major course normally occasions withdrawal from a degree program not later than the end of the ensuing semester or term: a grade of *F* in a minor course occasions academic probation.

COURSES PRIMARILY FOR UNDERGRADUATES. Students granted provisional admission and others whose preparation is found deficient may on occasion be required as part of their program to take undergraduate courses as prerequisites to continued graduate study. Undergraduate courses thus taken and others elected by the student will carry no graduate credit.

In exceptional cases, 100-level courses outside the major department may be taken for graduate credit to a maximum of two one-semester courses or one year-course not exceeding a total of 8 units, when approved by the Directors of Graduate Studies in the major department and in the department in which the course is listed and the supervisor of the program.

NORMAL REGISTRATION. A graduate student is designated as fully registered when he registers for the maximum credit his program requires. Required registration is set in consideration of the student's obligation to teach or assist and the stage he has reached in completion of degree requirements. Normal registration for the resident student who does not hold an appointment as part-time instructor or assistant is 15 units a semester or 30 units an academic year. The normal registration for the student who holds such an appointment is either 12 units or a minimum of 9 depending upon the number of hours a week he is required to teach or assist.

The resident student in a terminal master's program which requires no thesis carries normal registration until he has met all degree requirements. If a thesis is required and the student has met all requirements except for submitting his thesis, he registers for 3 units a semester while in residence or, if he elects to go out of residence, for 1 unit *in absentia* (a semester) until the thesis is accepted.

The resident student engaged in a master's program which is not

terminal but preparatory to a doctoral program registers as though he were a doctoral student.

The resident student in a doctoral program carries normal registration through the semester in which he passes the preliminary examination. Thereafter until the dissertation is accepted he registers for a minimum of 3 units a semester. If he elects at any time to go out of residence, to keep his program active he registers for 1 unit a semester *in absentia*.

The registration of 1 unit a semester *in absentia* is not considered full registration and does not provide access to library carrel, laboratory space, or Student Health but does permit occasional consultation with the thesis or dissertation supervisor. It may be waived for military duty or serious problems of health. Master's candidates subject to the fee for submitting a thesis in the academic year may credit the 1-unit fee to this charge.

In the Summer Session 6 units a term is maximum registration. Students resident in the academic year who wish to continue study and use of University facilities including Summer Session Student Health during the summer must register for 1 unit in the first Summer Session term. This registration provides use of these facilities for both terms.

TRANSCRIPT. A student who wishes to transfer his credits from Duke University to another institution is entitled to one free transcript of his record. A fee of one dollar, payable in advance, is charged for each additional copy. Requests are directed to the Central Records Office.

SIZE OF CLASSES. Classes which carry graduate credit are limited in size to 30 students. In exceptional cases this regulation may be modified, but only by permission of the Executive Committee of the Graduate School Faculty on the recommendation of the department concerned. When courses numbered 200 to 299 carry graduate credit, they may include no more than three juniors and such juniors must, at the time of registration, have an over-all B average.

The Master of Science Degree

The degree of Master of Science (M.S.) is offered in the fields of civil, electrical, and mechanical engineering. As prerequisites to this degree the student must have earned a Bachelor's degree from an accredited engineering college and have completed a minimum of 12 semester hours work in the major field.

The M.S. program is designed to provide breadth of background in the science of engineering with particular reference to the major field. Requirements for this degree comprise: major and minor courses, a

thesis, and a final examination. There is no foreign language requirement.

MAJOR AND MINOR COURSES. Course requirements are a minimum of 12 units of graduate credit in the engineering area, 6 units in related minor work outside of engineering, and 6 units in either major or minor area.

THE THESIS. The M.S. thesis should demonstrate the student's ability to investigate and report in a scholarly manner on a research problem in his major field.

THE EXAMINATION. The candidate for the M.S. degree must appear before an examining committee for an examination on the subject matter of his thesis and his major field.

TIME LIMIT. The M.S. degree candidate who is in residence for consecutive academic years should complete all requirements within two calendar years of his first registration. Any candidate must complete all requirements within six calendar years of his first registration.

The Doctor of Philosophy Degree

The degree of Doctor of Philosophy (Ph.D.) is offered in the fields of civil engineering and electrical engineering. Although course work is a necessary part of a doctoral program, the granting of the Ph.D. degree is based primarily on the student's knowledge of a specialized field of study and upon the production of an acceptable dissertation embodying the results of original research in that field. Formal requirements for this degree are: foreign languages; major and minor course work; supervisory committee; residence; preliminary examination; dissertation; final examination. Candidacy for this degree can be established only if all course work of the first year of graduate study has been passed, at least 9 units of it with a grade of G or better.

FOREIGN LANGUAGES. A demonstrated mastery of two foreign languages, normally French and German, is a requirement for the Ph.D. degree. Substitution of another language bearing a relation to the program of work may be made with the approval of the Dean of the Graduate School. The language requirement may be met either by proper transcript or by examination.

MAJOR AND MINOR SUBJECTS. The program of study for the Ph.D. degree must include a minimum of 24 units of graduate course work in engineering and a minimum of 24 units of minor course work, normally in mathematics and physics or chemistry.

SUPERVISORY COMMITTEE. Upon recommendation of the Director of Graduate Studies of the major department, the Dean of the

Graduate School appoints a supervisory committee of at least five members to formulate the student's program of study and to serve as the examining committee for both the preliminary and the final Ph.D. examination. The instructor who is to direct the student's research serves on this committee as its chairman.

RESIDENCE. The minimum requirement for the Ph.D. degree is 60 units of graduate credit: 48 units of course work and 12 units of dissertation credit. Not more than 30 units of credit may be accepted by transfer. Since a full program is 30 units per academic year, a candidate who enters with the Bachelor's degree must expect to spend in residence a *minimum* of two academic years, and a candidate who enters with the Master's degree must expect to spend in residence a *minimum* of one academic year. The student's supervisory committee will determine what residence requirements, if any, must be met above the minimum.

PRELIMINARY EXAMINATION. A student is accepted as a candidate for the Ph.D. degree only after he has passed a preliminary examination at this Graduate School. This examination ordinarily covers both the major and minor fields, and normally is taken by the end of the second year of resident graduate work.

THE DISSERTATION. The dissertation is expected to be a mature and competent piece of writing, embodying the results of significant and original research. It is expected that the dissertation will be submitted and accepted within two calendar years of passing the preliminary examination. If acceptance of the dissertation has not been accomplished within four calendar years of the preliminary examination, an extension of no more than one calendar year may be granted by the Dean of the Graduate School upon petition of the candidate.

FINAL EXAMINATION. The final requirement for the Ph.D. degree is the passing of an oral examination which is based primarily on the dissertation but may involve the candidate's major field. If a student fails his final examination, he may be granted only one re-examination. Failure to pass the second examination renders the student ineligible to continue work for the Ph.D. degree at Duke University.

Honors, Prizes, Activities

Engineering Undergraduate Academic Honors

DEAN'S LIST: In recognition of academic achievement, students who earn an average quality point ratio of 3.0 or higher on a semester's work of not less than the minimum academic load are placed on the Dean's List.

CLASS SCHOLARS: The five students in each combined undergraduate class of the University (including Trinity College, The Woman's College, and the College of Engineering) who achieve the highest quality point ratio on at least a normal course load for each academic year shall be designated Class Scholars.

CLASS HONORS: To be eligible for Class Honors a student must earn, during the year, credit for at least the minimum academic load permitted by the college in which he is registered. Students in the freshman, sophomore, and junior classes who earn a 3.50 quality point ratio on all work for the year are eligible for Class Honors.

GRADUATION HONORS: To be eligible for consideration for Graduation Honors a student must have completed in residence a minimum of ninety semester hours. Students who earn an average of at least a quality point ratio of 3.50 are recommended for a degree *magna cum laude.* Those who earn a quality point ratio of 3.75 are recommended for a degree *summa cum laude.*

GRADUATION WITH DEPARTMENTAL DISTINCTION: Graduation with Distinction in Civil, Electrical, or Mechanical Engineering is awarded to the student who, in the opinion of the department and of a special committee of the faculty, has demonstrated exceptional achievement in the area of his special interest.

HONORS-MASTERS PROGRAM

(See *Bulletin of Undergraduate Instruction* for description.)

DISTINGUISHED PROFESSOR SEMINARS

(See *Bulletin of Undergraduate Instruction* for description.)

Engineering Awards and Prizes

The Tau Beta Pi Prize: The North Carolina Gamma Chapter of Tau Beta Pi, engineering national honor society, awards each year a suitable prize, such as an

engineering handbook, to a sophomore student in engineering for outstanding scholastic achievement during the freshman year.

The American Society of Civil Engineers Prize: Consists of a certificate of award and a one year's payment of dues in the American Society of Civil Engineers. Awards are made annually by the North Carolina Chapter to the two outstanding seniors in civil engineering based on the recommendation of the faculty of the Civil Engineering Department. The basis for selection is the student's scholastic record, his contribution to the Student Chapter, and his participation in other college activities and organizations.

The George Sherrerd III Memorial Award in Electrical Engineering was established in 1958 by the parents of George Sherrerd III, a graduate of the class of 1955, to recognize outstanding undergraduate scholarship. This award, consisting of the income from a fund of $5000.00, is made annually to that senior student in Electrical Engineering who, in the opinion of the Electrical Engineering faculty, has attained the highest level scholastic achievement in all subjects and simultaneously has rendered significant service to the College of Engineering and the University at large. The recipient's name is inscribed on a plaque displayed in the Engineering Building.

The Charles Ernest Seager Memorial Award, established in 1958 by the widow and friends of Charles Ernest Seager, a graduate of the class of 1955, recognizes outstanding achievement in the annual Student Prize Paper Contest of the Duke Branch of the Institute of Electrical and Electronics Engineers. The award consists of inscribing the name of the contest winner on a plaque displayed in the Engineering Building.

The Milmow Prize: Consists of a certificate of award and a one year's payment of dues in the Institute of Electrical and Electronics Engineers for the membership year in which the honoree is awarded his baccalaureate degree. It is awarded annually to that student from North or South Carolina graduating in the Department of Electrical Engineering who, in the opinion of the faculty of that department and as shown by his grades, has made the most progress in electrical engineering during his last year in college.

The William Senhauser Prize: Given by the mother of William Senhauser in memory of her son, a member of the class of 1942, who lost his life in the Pacific Theatre of War on August 4, 1944. The award is made annually to the sophomore or junior in Trinity College or the College of Engineering who has made the greatest contribution through participation and leadership in intramural sports. The winner of this prize is chosen by a committee selected by the President of the University.

The Walter J. Seeley Scholastic Excellence Award: The Engineers Student Council, in the name of Dean (Emeritus) Walter J. Seeley, presents annually an award to that member of the graduating class of the College who has achieved the highest scholastic average in all subjects and who has shown diligence in the pursuit of an engineering education. The recipient of the award is determined by a committee composed of the chairmen of the respective departments, the Assistant Dean of the College of Engineering, and a representative of the Engineers Student Council. This award is initiated in the spirit of academic excellence and professional diligence demonstrated by Dean Seeley. The Council hopes that this award will serve as a symbol of the man and the ideals for which he stands.

Activities

STUDENT BRANCHES OF ENGINEERING PROFESSIONAL SOCIETIES

The three Departments of the College support student branches of the following national professional engineering societies: *American Society of Civil Engineers, American Society of Mechanical Engineers, Institute of Electrical and Electronics Engineers.*

ENGINEERS' STUDENT COUNCIL

The Engineers' Student Council, composed of approximately 14 members from the various organizations and classes in the engineering student body, coordinates the activities of all student organizations in the College. The Council acts to represent the interests of the students in their relationships with the public, the faculty, and the administration. The Council is responsible for such activities as the Engineers' Show, homecoming displays, supervision of the student Lounge, social events, and the Engineers' Guidance Council.

ENGINEERING STUDENT PUBLICATION

The DukEngineer, official student-published magazine of the College, which appears twice each semester, contains articles on technical and semi-technical topics and other matters of interest in the College.

ENGINEERS' RADIO ASSOCIATION

Membership in the Engineers' Radio Association is open to all students of the College of Engineering who have an interest in amateur radio. The Association operates amateur radio station W4AHY and conducts code and theory classes for members who desire to obtain a Federal Communications Commission license.

ENGINEERING GUEST LECTURE SERIES

In addition to his participation in the student branches of the national professional engineering societies, the student has the opportunity of additional development through the *Engineering Guest Lecture Series.* The general function of the series is to provide stimulating lectures by outstanding members of the engineering profession.

GENERAL ACTIVITIES OPEN TO ENGINEERS

As part of the University Community, students in the engineering programs share in all activities open to students.

ENGINEERING HONOR SOCIETIES

Tau Beta Pi—engineering national honor society—Gamma Chapter of North Carolina.

Chi Epsilon—civil engineering national honor society—Duke University Chapter.

Eta Kappa Nu—electrical engineering national honor society—Delta Lambda Chapter.

Pi Tau Sigma—mechanical engineering national honor society—Pi Iota Chapter.

Order of St. Patrick—honor society recognizing leadership in engineering student activities.

GENERAL HONOR SOCIETIES

In addition to the national engineering student honor societies, students of the College are eligible for membership in the national and local honor societies throughout the campus.

Faculty Emeritus and Staff

Faculty Emeritus

Harold Crusius Bird, C.E., *Professor Emeritus of Civil Engineering*
William Holland Hall, A.M., M.S.C.E., *J. A. Jones Professor Emeritus of Engineering*
Walter James Seeley, M.S., *Dean Emeritus, James B. Duke Professor Emeritus of Electrical Engineering*
Ralph Sydney Wilbur, M.E., *Professor Emeritus of Mechanical Engineering*
Frank Nicholas Egerton, A.M., E.E., *Associate Professor Emeritus of Electrical Engineering*

Supporting Staff

SUPERVISED TEACHING INTERNS

Robert R. Biggers (1964), B.S.M.E. (Duke), *Mechanical Engineering*
Norman Lee Owsley (1963), B.S.E.E. (Lehigh), *Electrical Engineering*
Jai Raj Narain Rajan (1960), M.S. (Duke), *Civil Engineering*
Robert B. Roe, Jr. (1963), B.S.E.E. (Clemson), *Electrical Engineering*
John Oates Woods, Jr. (1964), B.S.C.E. (The Citadel), *Civil Engineering*

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Ihsan M. H. Bábaá (1961), B.S.E.E. (Illinois Institute of Technology), *Electrical Engineering* (R)*
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Charles Joseph Weisner, *Engineering Precision Shop Foreman*

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Secretary: E. B. Weatherspoon
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Electrical Engineering: T. G. Wilson, T. C. Pilkington
Mechanical Engineering: V. L. Kenyon, Jr., C. M. Harman
English: G. C. Harwell
History: T. Ropp
Mathematics: F. G. Dressel
General Administration: Provosts R. T. Cole, H. W. Lewis
Ex-Officio: R. L. Dickens, Assistant Dean of Arts and Sciences; C. R. Vail, Associate Dean of Engineering; E. K. Kraybill, Assistant Dean of Engineering

Faculty Committees

Academic Planning: Wilson; Brown, Harman, Harrawood, Hill, Kenyon, Owen, Pearsall, Pilkington
Bulletin: Kraybill; Arges, Harwell, Nash, Vail
Computer: Wood; Buzzard, Jones
Displays: Wood; Elsevier, Hammond
Educational Facilities: Meriam: Brown, Fairbank, Kenyon, Kraybill, Vail, Wilson
Engineering Publications Advisory: Harman; Barton, Harwell
Executive: Meriam; Brown, Kenyon, Kraybill, Vail, Wilson
Freshman Advisory: Kraybill; Artley, Buzzard, Haines, Holland, Lewis, Sheppard, Wood
Guest Speaker Program: Brown; Harman, Vail
Library: Bryan; Artley, Axman, Boyle, Meier
Schedule: Kraybill; Elsevier, Harrawood, McElduff, Meier
Upperclass Advisors: Boyle, Bryan, George, Harrawood, Kenyon, Meier, Nash, Palmer, Pilkington

Index

Absences, 55, 56
Absher, R. G., 22
Academic Class Standing, 54
Academic Regulations, 53, 57
Activities, 64
Administration
  General, 4
  Engineering, 4
Admission
  Advanced Placement, 10
  Advanced Standing, 10
  By Examination, 9
  Early Decision Plan, 9
  Freshmen, 9
  Graduate School, 12
  Procedure, 9, 12
  Readmission, 11
  Requirements, 9
  Special Students, 11
  Women Students, 11
Advanced Placement, 10
Advanced Standing, 10
Aid, Student, 47
Air Force Reserve Corps, 44
Appointments Office, 52
Arges, K. P., 13
Artley, J. L., 22
Assistance, Graduate, 49
Attendance, 56

Bachelor of Science in Engineering, Requirements, 6, 54
Barnes, R. W., 22
Barton, F. W., 13
Boarding Accommodations, 50
Boyle, T. A., 32
Brown, E. I., III, 4, 13
Bryan, E. H., 13
Burger, R. M., 22
Buzzard, G. H., 32

Calendar of the College, 3
Chemistry Courses, 41
Civil Engineering, 13
  Courses of Instruction, 17
  Curriculum
    Graduate, 19
    Undergraduate, 17
  Facilities, 13
  Faculty, 13
  Graduate Program, 19
  Programs of Study
    Graduate, 18
    Undergraduate, 16
Class Standing, 53
College of Engineering
  Graduate Program, 11
  History, 6
  Organization, 7
  Physical Plant, 8
  Relationship to the University, 6
  Undergraduate Program, 6
Committees, Faculty, 66
Common Engineering Subjects, 40
Continuation in College, Requirements for, 54
Cost, per year, 45
Council, Engineering Faculty, 67
  Engineers' Student, 65
Counseling Center, 51
Course Load, 53

Courses of Instruction
  Chemistry, 41, 42
  Civil Engineering, 18
  Economics, 41
  Electrical Engineering, 26
  Engineeriug, Common, 40
  English, 41
  History, 41
  Mathematics, 41, 42
  Mechanical Engineering, 36
  Physics, 42, 43
Credit, 53, 54, 58
Curriculum
  Civil Engineering, 13
  Electrical Engineering, 24
  Mechauical Engineering, 32
  Degrees, Requirements for
    Bachelor of Science, 9, 53
    Master of Science, 18, 29, 38, 60
    Doctor of Philosophy, 29, 61

Degrees, 7
Dining Service, 50
Dismissal, 54
Distinction, Graduation with Departmental, 63
Djordjevic, M., 32
Doctor of Philosophy Degree, 29, 61
Dormitories
  Men, 49
  Women, 49

Early Decision Plan, 9
Economics Courses, 41
Electrical Engineering, 22
  Courses of Instruction, 26
  Curriculum
    Graduate, 29
    Undergraduate, 27
  Facilities, 24
  Faculty, 22
  Graduate Program, 11, 29
  Programs of Study
    Graduate, 29
    Undergraduate, 26
Elsevier, E., 32
Emeritus Faculty, 66
Employment, 47, 52
Engineering
  Administration, 4
  Building, Picture of, 1
  Civil, 13
  Committees, 68
  Electrical, 22
  Faculty, 13, 22, 32
  Faculty Council, 67
  Faculty Emeritus, 66
  Lecture Series, 65
  Library, 8
  Mechanical, 32
  Programs, 5
  Staff, 66
  Student Publication, 65
  Subjects, Common, 40
Engineers' Radio Association, 65
Engineers' Student Council, 65
English Courses, 41
Enrollment, 53
Examinations, 55, 56
Expenses, 45

Facilities
  Civil Engineering, 13
  Electrical Engineering, 24
  General, 8
  Mechanical Engineering, 32
Faculty, 13, 22, 32
Faculty Committees, 68
Faculty Council, Engineering, 67
Faculty Emeritus, 66
Fees, 45, 48
Fellows, 67
Financial Information, 45
Freshman Class Admission, 9

General University Administration, 4
George, R. T., Jr., 22
Grade Reports, 54
Grading, 55, 58
Graduate Assistance, 49
Graduate Assistants, 66
Graduate Program
  Civil Engineering, 12, 18
  Electrical Engineering, 12, 29
  Mechanical Engineering, 12, 38
Graduate School
  Academic Regulations, 57
  Admission, 11
  Assistance, 49
  Registration, 57, 59
Graduation
  From College, Requirements for, 54
  With Departmental Distinction, 63
  With Honors, 63
Guidance
  The Counseling Center, 51

Haines, H. N., 13
Harman, C. M., 32
Harrawood, Paul, 13
Hill, D. W., 13
History Courses, 41
History, College of Engineering, 6
Holland, C. N., 13
Honor Societies
  Engineering, 65
  General, 65
Honors, 63
Hours, Semester, 54

Incomplete Work, 55
Instructional Staff, 13, 22, 32, 66

Jenkins, J. E., Jr., 22

Kenyon, V. L., 4, 32
Koepsel, W. W., 22
Krauss, H. L., 22
Kraybill, E. K., 4, 22
Kumar, S., 13

Laboratories
  Civil Engineering, 13
  Electrical Engineering, 23
  Mechanical Engineering, 32
Lecture Series, 65
Lewis, R. E., 32
Library
  Description, 8
  Staff, 67
Living Accommodations, 50
  For Men, 50
  For Women, 50
Load Course, 53
Loans, 47

Macduff, J. N., 32
Master of Science Degree, 18, 29, 38, 60
Mathematics Courses, 42, 43
Matriculation, 53
McElduff, D. H., 4
McKeel, J. T., 22
Mechanical Engineering, 32
  Courses of Instruction, 36, 37
  Curriculum
    Graduate, 38, 40
    Undergraduate, 36, 37
  Facilities, 32
  Faculty, 32
  Graduate Program, 38
  Programs of Study
    Graduate, 38
    Undergraduate, 36
Meier, Otto, Jr., 4, 22
Meriam, J. L., 4, 32
Mixon, F. O., Jr., 32

Nash, T. H., Jr., 32
Naval Reserve Corps, 44
Non-Engineering Subjects, 41

Officers of Administration, 4
Officers of the College, 4
Olive, B. B., 22
Organization, College, 7
Organizations, 64
Owen, H. A., Jr., 4, 22

Palmer, A. E., 13
Palmer, D. F., 22
Pearsall, G. W., 32
Physical Plant, 8
Physics Courses, 42, 43
Pilkington, T. C., 22
Prizes, 63
Professional Societies, 64
Program of Study
  Civil Engineering, 16
  Electrical Engineering, 26
  Mechanical Engineering, 35
Publication, Student, 65
Public Lectures, 65

Quality Credit, 54
Quantity Credit, 53

Radio Association, 65
Readmission, 11
Research Associates, 67
Registration
  Graduate, 57, 59
  Undergraduate, 53

Regulations, Academic, 53, 57
Reports, 54
Reserve Officers Training Corps, 44
Residence Requirements, 55, 62
ROTC, 44

Scholarship Prizes, 63
Scholarships, 47
Semester Hours, 54
Sheppard, F. G., 13
Societies
  Honor, 65
  Professional, 64
Special Students, 11
Staff (Faculty)
  Civil Engineering, 13
  Electrical Engineering, 22
  Mechanical Engineering, 32
  Supporting, 66
Student Aid, 47
Student Council, 65
Student Employment, 47
Student Publication, 65
Supporting Staff, 66

Transcripts, 60
Transfer Credit, 10, 58
Transfer Students, 10, 58
Trickey, P. H., 22
Tuition
  Graduate, 48
  Undergraduate, 44

Uniform Requirements for Degrees, 9, 10
Units of Admission, 11, 12

Vail, C. R., 4, 22
Vesic, A. S., 13

Wells, B. A., 22
Williams, J. W., 13
Wilson, T. G., 4, 22
Withdrawal, 55
Women Students, 11
Wood, D. J., 13
Wortman, J. J., 22

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DUKE UNIVERSITY



Undergraduate Instruction

(Trinity College, the Woman's College, and the College of Engineering)

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For Bulletin of Undergraduate Instruction, apply to *The Registrar,* Duke University, Durham, N. C. 27706

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OF

DUKE UNIVERSITY

THE UNDERGRADUATE COLLEGES

TRINITY COLLEGE
THE WOMAN'S COLLEGE
THE COLLEGE OF ENGINEERING

ANNOUNCEMENTS FOR 1965-1966

DURHAM, NORTH CAROLINA
1965

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Provost

Gerhard Chester Henricksen, M.A., C.P.A.
Vice President for Business and Finance and Treasurer

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James Ligon Price, Ph.D.
Dean of Trinity College

James Lathrop Meriam, Ph.D.
Dean of the College of Engineering

Contents

PAGE

Calendar of the Colleges 5

Admission 6

Student Life and Services 8

The Summer Session 18

Financial Information 19

Medals and Prizes 27

General Academic Regulations 31

Other Regulations 40

Requirements for Degrees 42

Courses of Instruction: Trinity College and the Woman's College 56

Courses of Instruction: The College of Engineering 138

Index 147

1965

JULY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
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AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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29	30	31				

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			1	2	3	4
5	6	7	8	9	10	11
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26	27	28	29	30		

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3	4	5	6	7	8	9
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28	29	30				

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5	6	7	8	9	10	11
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27	28					

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27	28	29	30	31		

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DECEMBER

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Tentative Calendar of the Colleges 1965-1966

1965

September	17	Friday, 7:30 p.m. Orientation begins: Assemblies for all new students entering Trinity College, the Woman's College, and the College of Engineering.
September	20	Monday. Registration and matriculation of all students of Trinity College, the Woman's College, and the College of Engineering, who have not pre-registered.
September	22	Wednesday. Final registration of pre-registered students. All students must report to their Dean's offices for class cards. (See page 33.)
September	23	Thursday. Fall semester classes begin.
November	6	Saturday. Last day for reporting six-weeks grades.
November	15-18	Pre-registration for Spring Semester 1966.
November	24	Wednesday, 12:30 p.m. Thanksgiving recess begins.
November	29	Monday, 8:00 a.m. Classes are resumed.
December	11	Saturday, Founders' Day.
December	18	Saturday, 12:30 p.m. Christmas recess begins.

1966

January	3	Monday, 8:00 a.m. Classes are resumed.
January	15	Saturday, 12:30 p.m. Fall semester classes end.
January	18	Tuesday. Final examinations begin.
January	28	Friday. Final examinations end.
February	1	Tuesday. Registration and matriculation of new students.
February	2	Wednesday. Last day for matriculation for the spring semester. All students must report to their Dean's offices for class cards. (See page 33.)
February	3	Thursday. Spring semester classes begin.
March	16	Wednesday. Last day for reporting six-weeks grades.
March	21-24	Pre-registration for Summer Session and Fall Semester 1966.
March	26	Saturday, 12:30 p.m. Spring recess begins.
April	4	Monday, 8:00 a.m. Classes are resumed.
May	19	Thursday, 5:00 p.m. Spring semester classes end.
May	21	Saturday. Final examinations begin.
June	1	Wednesday. Final examinations end.
June	4	Saturday. Commencement begins.
June	5	Sunday. Commencement Sermon.
June	6	Monday. Graduating Exercises.

Admission

NEW STUDENTS are admitted for the academic year at the opening of school in the fall.

The size of the entering classes is approximately as follows: Trinity College, 600; Woman's College, 350; College of Engineering, 175; the School of Nursing, 95. Since five thousand candidates normally apply and enrollment is limited, the Committee on Admissions selects those students who in its judgment are best qualified to benefit from the opportunities which the colleges offer. Selection is based not only upon academic grades and test scores but also upon recommendations of school officials and other personal criteria.

Although there are no inflexible subject matter requirements, at least fifteen acceptable units of secondary school credit must be presented. Of these at least twelve must be in college preparatory subjects: English, foreign language, history and social studies, mathematics, and physical or biological sciences. Applicants for the College of Engineering are advised to present four units of mathematics and at least one unit in physics or chemistry.

Students applying for admission are required to take the Scholastic Aptitude Test, the English Composition test, and two other achievement tests of their own choosing given by the College Entrance Examination Board. Candidates applying to the College of Engineering must include the appropriate mathematics test.

Prospective students are urged to broaden their reading outside of class during their senior year and to make the acquaintance of books and magazines that do not form part of the subject matter of their courses. At the same time, they should take every opportunity to increase their competence in writing. Those who cannot write simple, clear, grammatical English prose will be progressively at a serious disadvantage in the competition for admission and also in the general work of the Freshman year. Careful attention to correctness in English in correspondence and on application blanks cannot be too seriously stressed for candidates for admission.

Early Decision Plan

For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on December 1 of the student's senior year in secondary school. The deadline date for completing applications for Early

Decision is November 1. Interested students should write to the Office of Admissions for detailed information.

Regular Admission

Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group, decisions are mailed by April 15.

Application forms and instructions regarding procedure and necessary documents to be included will be sent upon request to the Office of Admissions, Duke University, Durham, North Carolina, 27706. A non-refundable processing fee of $10.00 must accompany the submission of the full application form.

Candidates for admission to the School of Nursing should address their inquiries to the Dean of the School of Nursing, Hanes House, Duke University, Durham, N. C., 27706.

A candidate for admission who wishes to arrange an interview should do so through the Director of Undergraduate Admissions.

Admission to Advanced Standing

Admission by transfer from other institutions may be arranged for a limited number of students, under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal, and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students may not apply for transfer beyond admission to the junior class. Further detailed regulations for admission by transfer may be obtained from the Office of Admissions.

A small number of special students of mature age may be admitted for such courses of instruction as their earlier training and experience may qualify them to take. They may not be accepted, however, as candidates for a degree in a regular course unless they are able to meet all normal requirements for admission which apply to all beginning students.

Former students who have for various reasons withdrawn from college and who wish to continue their collegiate careers should apply to the Office of Admissions, with a detailed account of their activities since withdrawal from college.

Student Life and Services

The Libraries

TO SUPPORT a rich educational experience in a world of rapid and far-reaching change, great library collections are essential. Undergraduate students at Duke are fortunate to have available exceptional resources. The University library, among the first nineteen university libraries in the country, contains 1,650,000 volumes and 4,000,000 manuscripts. About 60,000 volumes are added annually. Separate departmental and professional school libraries provide notable collections in the several disciplines.

The Woman's College library, with its own attractive Georgian building contains 145,000 volumes in an open stack collection, chiefly those books most frequently used in the undergraduate curricula. The larger collections of the main and specialized libraries are at hand when needed.

More detailed information may be obtained in a "Student's Guide to the General Library," available on request to the Librarian of the University.

Medical Care

The Student Health Program is closely related to the Teaching Hospital of the Duke University Medical Center. This arrangement provides an unusually comprehensive service, available at all times. The cost, for regularly enrolled students, is included in the general fee paid each semester, and in the fees charged each student in the summer quarter.

The Service is under the direction of the University Physician with the cooperation of the Staff. It includes hospitalization in Duke Hospital, as deemed necessary by the Hospital Staff, but limited to thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Special nursing is not covered. Students pay for board while in the hospital. Refraction of eyes, treatment of teeth and of all chronic and pre-existing conditions, such as diseased tonsils, hernias, pilonidal cysts and other elective surgery, chronic skin conditions, endocrine disturbances, etc., are not included. The cost of any necessary braces and orthopedic appliances, and special nursing, must be borne by the students. Blood used for transfusions must be paid for or replaced.

If students have insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of their medical care. Accidents or illnesses occurring during vacations or while off the campus are not included in this service. A special commercial policy available only to regularly enrolled Duke students furnishes complementary protection, if desired.

Advisory consultation with a psychiatrist at no expense is available to students through referral either by the Student Health Physicians or by the Deans, but office visits for psychotherapeutic interviews are not included in this service.

A woman physician is in charge and a nurse in constant attendance at the Woman's College Infirmary. Women students receive ambulant care at regular office hours, and patients in this Infirmary can be transferred to the Duke Hospital at any hour of the day or night.

Male students receive ambulant care at the Student Health Office in the hospital during regular office hours. The emergency service and the specialist consulting services of the Hospital and Medical School are always available.

Students are given careful physical examinations upon arrival at the University. Every applicant should be re-vaccinated against smallpox within three years before admission to the University. It is urgently advised that an oral vaccine routine for poliomyelitis be completed by all students and that all be actively immunized to tetanus by injections of toxoid.

Simple directions for procedure in reporting the students' needs for medical care are contained in the Student Handbook supplied to each student upon entering.

Special Services

Other services of many kinds are available to all undergraduate students. Among these may be cited the educational, personal, and vocational counseling provided through the University Counseling Service. Through the Appointments Office, undergraduates are assisted in their search both for summer employment and post-graduation positions.

Physical Education

Students of Trinity College and the College of Engineering who have no restrictive physical handicap must enroll in a physical education class each of four semesters. The first two of these four involves Foundations of Physical Education. This course gives emphasis to the how and why of Physical Activity. Following an extensive test battery designed to assess basic body potential, students are presented with

information and techniques necessary for making desirable physical changes and maintaining health and fitness while in college and throughout life. They are given an opportunity to become acquainted with a variety of skills in team, individual, and dual sports, and are guided into future activities which will most adequately meet their needs. Students who cannot swim are required to learn how during the Freshman year. The last two semesters may be devoted to activity of the individual's choice from a number of sports of a recreational nature, such as badminton, basketball, golf, handball, swimming, tennis, and volleyball. A total of four semester hours credit toward graduation and quality points according to the marks assigned are awarded for these activities. In instances where the University Health Service examination indicates that specific types of activity may be beneficial, a modified program is available as medically prescribed. Normal credit is awarded for participation in the modified program.

In addition to the four semesters of required physical education, each student may voluntarily participate in the intramural program, which includes a dozen sports and attracts a large percentage of the student body. In a typical year more than 3,000 students forming fraternity, dormitory, and organizational teams, participate in seventeen tournaments and compete for more than fifty trophies.

For each semester of undergraduate enrollment, the student is issued a uniform appropriate for the season and the activity in which he is engaging. The uniform is issued, exchanged, laundered, and maintained at no additional expense to the student. Students may check out various sports equipment and may use all facilities when not otherwise scheduled. This includes the following:

Golf Course	Swimming Pool	Gym Floor	Gymnastics Area
Tennis Courts	Handball Courts	Weight Room	Archery Range

Numerous clubs dealing with Fencing, Gymnastics, Scuba Diving, Sailing, Cycling, etc. are also available to interested students.

The physical education program in the Woman's College is designed to give the students an appreciation of the value of activity for general physical well-being, skill in one or more activities which can be enjoyed as recreation during and after college, a well-developed and well-coordinated body, and a knowledge of good posture. To this end, students are allowed to choose from a large number of activities, including individual, dual and team sports, swimming, and several types of dancing. Each student during her two years of required physical education must elect one course in dance. Students who are unable to pass the swimming test must elect one course in swimming. Students whose test scores indicate special needs must elect a course in fundamentals of movement, rhythm, sports, or posture during the first half-semester.

Within the Woman's Recreation Association various clubs including Terpsichorean (modern dance), Nereidian (water ballet), and other sports groups offer opportunities for each student to take part in the various extra-curricular activities most interesting to her. The swimming pool, tennis courts, bowling alleys, and other athletic facilities are available to all students for use at specified times.

In order to maintain certain hygienic standards of physical education and intramural athletics, the University has made available for all students, in addition to facilities for physical activity and recreation, the following equipment and services:

1. Gym suit, dance leotard, bathing suit, warm-up suit.
2. Provision for locker and handling of uniform.
3. The laundering of uniforms and towel as needed.

THE INTERCOLLEGIATE ATHLETIC PROGRAM FOR MEN

The program, controlled entirely by the University, consists of the organization and training of representative freshman and varsity teams in football, baseball, basketball, track, cross country, golf, lacrosse, soccer, swimming, tennis, and wrestling. In addition to these intercollegiate sports an informal fencing program is sponsored by the University.

The program is under the supervision of the Athletic Council, composed of seven members. Three of the seven are appointed by the President of the University from the faculty as follows: one member from the Officers of General Administration, one from the Officers of Educational Administration, division of the Colleges, and one from the Officers of Instruction of the undergraduate colleges. From this group the President of the University appoints the faculty chairman, who serves as chairman of the Athletic Council and of its executive committee.

Four of the seven members are selected from the alumni. One of the four, a University Trustee, an alumnus, and a member of the Board's standing Committee on Physical Education and Athletics, is appointed not less frequently than every three years by the chairman of the Board of Trustees. The remaining three, who may not succeed themselves, are elected annually by the general Alumni Association for terms of three years. The Director of Alumni Affairs serves *ex officio* as secretary of the Council and of the executive committee.

The three faculty members of the Athletic Council constitute a committee which has the responsibility of enforcing the scholarship and athletic requirements of the University for participation in intercollegiate sports. The athletic eligibility rules are those of the Atlantic Coast Conference.

The executive committee of the Athletic Council is composed of the faculty chairman of the Council, one other faculty member of the Council and one alumni member of the Council. The executive committee of the Council recommends to the President of the University persons to serve as Director of Athletics and as coaches in the various sports. The election of such persons, however, rests solely with the Board of Trustees of the University or with its Executive Committee on recommendation of the President of the University. The Director of Athletics recommends to the Athletic Council athletic schedules and the award of insignia of merit earned by members of the athletic teams. These decisions are the responsibility of the Athletic Council subject to approval of the President.

Each of the four undergraduate classes selects annually, for a term of one year, a member of each respective class to serve in an advisory capacity to the Athletic Council on the matter of awarding insignia of merit.

All funds from athletic events are handled entirely by the Treasurer of the University. An audit of the receipts and disbursements of these funds is made annually by the official auditors of the University and a report thereof made annually to the Executive Committee of the Board of Trustees.

Social and Cultural Organizations

Although the campuses for men and women are geographically separated, extra-curricular life is in many respects coeducational. Each campus has its own Student Government Association, its own inter-social councils, and its own local and individual groups. In many areas all of these meet for inter-college life. The scope of these more than one hundred separate student organizations fall into many broad interest areas, such as student government, service, professional and honorary, publications and radio, music, drama, and social.

In the area of government, in addition to the Student Government Associations, are the Pan-Hellenic and Interfraternity Councils, the Independent House Association, and the Social Standards Committee. The Student Union, Symposium Committee, and the YMCA and YWCA groups are primarily service organizations. The Professional and Honorary organizations are numerous and include traditional Greek letter societies, such as Phi Beta Kappa, as well as national and local academic and leadership groups.

The Duke Chronicle, the campus newspaper, is published twice a week, and the student radio station, WDBS, operates daily. Three magazines and a comprehensive yearbook are published by students. Student publications are under the control of the Publications Board, composed of six members from the University staff appointed by

the President; six men from the Junior and Senior classes, elected by the students in Trinity College and the College of Engineering; four women from the Junior and Senior classes, elected by the students in the Woman's College; and one from the Junior and Senior classes, elected by the students in the School of Nursing; and four editors and four managers of student publications, *ex officio* members without voting power. No student publication can be established at the University without the approval of the Board.

The musical groups include the Chapel Choir, Symphony Orchestra, Concert Band, Glee Clubs, and several smaller groups. The Duke Players present a number of plays and readings each season. The Hoof 'n' Horn Club annually produces a musical comedy which is written, cast, directed, and acted by students from the three colleges.

Other campus groups, social in nature, sponsor dances, chaperoned cabin parties, concerts, and informal discussion groups. Social functions are frequent enough to afford the relaxation needed from work required in class room and laboratory.

Approximately half of the undergraduate students belong to fraternities and sororities. Although there are no chapter houses, the program of fraternity and sorority activity is carried on within the sections of the regular dormitories or buildings set aside for this purpose. Eighteen national social fraternities and thirteen national sororities have chapters on campus.

The Union Building, located on the West Campus, is the student center for coeducational activities. It houses, among other groups, the Student Union organization. This body is unique in its coeducational aspects, bringing the men and women together in the carrying out of its stated purpose, "to stimulate, promote, and develop the social, recreational, cultural, educational, and spiritual activities of the students of Duke University." This purpose is carried out through a broad program including lectures, concerts, recreational activities, dances, exhibits, etc., adapted to the leisure time interests and needs of all students, who as undergraduate students are members of the Union.

In one section of the West Campus Union are housed the Alumni offices, dining facilities, University store, grill, soda fountain, post office, barber shop, bank, and ball room. Elsewhere in the building are student organization offices, meeting rooms, an information center, and music, reading, lounge and recreational areas. Many similar service and activity areas for the Woman's College are provided on that campus.

Religious Life

"Eruditio et Religio," the motto emblazoned on the seal of the University, proclaims belief in the essential union of knowledge and

religion in the educational process. The Gothic Chapel stands at the center of the campus, an inspiring symbol of the place of religion in the well-balanced life. The Chapel program encourages the cultivation of the moral and spiritual life of students.

In the University Service of Worship on Sunday morning two hundred students participate by singing in the choir; at least one hundred other students aid in special ways, as ushers, collectors, and assistants in the communion services.

Opportunities are provided through the Chapel and its related activities to translate worship into effective Christian living. Denominational, interdenominational, and interfaith loyalties are emphasized. Protestant, Roman Catholic, and Jewish students are organized in their respective groups, each having a denominational chaplain or adviser.

The University Religious Council, composed of students and faculty, promotes the interdenominational religious life in its many facets. The work of the Council and of the denominational program is under the supervision of the Chaplain to the University, who is also Director of Religious Life. He, with two Associate Directors of Religious Life and six denominational chaplains, coordinates the religious program of the campus. They also offer personal guidance and spiritual counsel to all students in matters related to their faith.

The Dean of the Chapel is a key figure in student religious life. A regular preacher to the University, he preaches in the Chapel each month. He serves as an officiating minister and participates in the planning of the University's religious program.

Additional opportunities for the enrichment of the student's religious life are offered in organ and carillon recitals, choral concerts, other special services held from time to time, and in the sermons of distinguished guest preachers from many lands who are heard in the Duke Chapel. Some students, at their own discretion, participate actively in the programs of the downtown churches of their choice.

Reserve Officers Training Corps

Through the Naval and Air Force Reserve Officers Training programs the University is cooperating with the Department of Defense in providing well-educated officers for the regular and reserve forces of the Nation.

THE NAVAL RESERVE OFFICERS TRAINING CORPS: There are two basic programs through which students can qualify for Naval commissions upon graduation; one, the Regular Naval Reserve Officers Training Corps program, which provides a maximum of four years in the University largely at government expense, followed by a commission in the regular Navy or Marine Corps; the other, the

Contract program, which leads to a commission in the Naval Reserve or the U. S. Marine Corps Reserve.

The Regular Student—Quotas are awarded on the basis of an annual nation-wide test and selection procedure. Students selected are appointed Midshipmen, USNR, and receive four years tuition, fees, and textbooks at government expense plus retainer pay at the rate of $600 per year. The regular midshipman may take any course leading to a baccalaureate or higher degree with certain exceptions, e.g., pre-medicine and medicine, pre-theological and theological, music and art. His academic program must include 21 semester hours of Naval Science, 3 semester hours of General Psychology, one year of college physics and one year of college mathematics. The Naval Science requirement is reduced to 15 semester hours for students who are awarded Engineering Degrees upon graduation; Naval Engineering is waived and, in lieu of Naval History (NS 102, 3 s.h.), the Engineering student is required to take Naval History and Elementary Strategy (History 99, 3 s.h.). The Regular midshipman participates in two summer training cruises aboard ship and receives aviation and amphibious indoctrination at naval shore stations for one summer. Upon graduation he receives a commission as Ensign in the Regular Navy, or Second Lieutenant in the Regular Marine Corps, after which he serves with the Navy or Marine Corps, as required by the Secretary of the Navy in the same manner as his officer contemporaries who are graduates of the U. S. Naval Academy. The minimum period of commissioned service is four years for regular officers.

The Contract Student—The contract student is selected from those regularly enrolled in Duke University who desire to qualify for a commission in the Naval or Marine Corps Reserve while pursuing normal courses of study. Since he will be ordered to three years active duty immediately on graduation and commissioning, the Navy does not recommend that a medical, dental or theological student apply for this program. He must include in his academic program mathematics through trigonometry (if not successfully completed in secondary school), or one semester of college mathematics, 3 semester hours of General Psychology, and 21 semester hours of Naval Science. The Naval Science requirement is reduced to 15 semester hours for students who are awarded Engineering degrees upon graduation; Naval Engineering is waived and, in lieu of Naval History (NS 102, 3 s.h.) the Engineering student is required to take Naval History and Elementary Strategy (History 99, 3 s.h.). He has the status of a civilian who has entered into a mutual contract with the Navy and is not eligible for the benefits and pay received by regular midshipmen. He receives retainer pay of $40 a month during his last two years in the NROTC. He goes aboard ship for one summer training cruise, normally between his junior and senior years. Upon graduation, he is commissioned

in the Naval or Marine Corps Reserve and reports for a minimum of three years active duty. Upon completion of the minimum active service requirements he may request transfer to the regular component of the Navy or Marine Corps, retention on active duty as a reservist, or transfer to the inactive reserve.

Both Regular and Contract midshipmen are deferred from Selective Service by virtue of their commitment to serve on active duty after graduation. The Navy furnishes necessary uniforms and equipment. Uniforms are worn only on drill days or other special occasions when prescribed by the Professor of Naval Science. Regular and Contract students receive the same instruction and wear the same uniforms. No distinction is made between the two in the NROTC Unit. Contract students may compete each year for the Regular Program, and if selected, they will be appointed to Regular status with the subsequent benefits.

THE AIR FORCE RESERVE OFFICERS TRAINING CORPS:

This unit functions as a regular department of instruction known as the Department of Aerospace Studies. It selects, trains, and commissions college men who desire to serve in the United States Air Force.

For enrollment in the Basic Course (freshman and sophomore years) the student must be accepted by the institution as a regularly enrolled student; must successfully complete such general survey and screening tests as may be prescribed; and must sign a loyalty certificate with the U.S. Government. Students initially entering the University who have had previous preparatory or high school military training are normally accepted in the Basic Aerospace Studies at the same academic level as that in which they are accepted by the University. The student may elect to attend a six weeks Field Training Course conducted at selected Air Force Bases instead of enrolling in the Basic Course. If he chooses this option he will report to the Field Training Unit during the summer between his sophomore and junior years. To be eligible for continuation, or initial enrollment, in the Advanced Course (junior and senior years), a person must:

(1) be a citizen of the United States;

(2) be selected for advanced training under Air Force procedures;

(3) enlist in the United States Air Force Reserve;

(4) contract, with the consent of his parent or guardian if he is a minor, to complete the program of advanced training;

(5) agree in writing that he will accept a commission in the United States Air Force, and that he will serve in the Air Force for the period prescribed by the Secretary of the Air Force:

(6) complete successfully:

(a) the Basic Course; or

(b) six weeks of summer Field Training; or

(c) have had at least one year of honorable service in the Armed Forces of the United States. Students who qualify for the Advanced Course by successfully completing the Basic Course must attend four weeks of Field Training between their junior and senior years. Students must also agree to take orientation flights when offered; must be less than 28 years of age at the time of graduation; must successfully complete such general survey and screening tests as may be prescribed and must be selected by the Professor of Aerospace Studies and the appropriate authority of the University.

Students in the Basic Course may be deferred from Selective Service upon satisfactory completion of one semester of Basic Aerospace Studies. Advanced students are deferred as soon as they are formally enrolled in the Advanced Course.

All uniforms, texts, and training equipment required for the Aerospace Studies Course are furnished at government expense, and students are paid a total of approximately $900.00 for the two years of the Advanced Course.

A thirty-five hour Flight Instruction Program using light aircraft is restricted to seniors who may, upon completion of the course, qualify for a Civilian Private Pilot's License. To participate in this program, Fourth Year Cadets must be physically and aptitudinally qualified for the Air Force Flight Instruction Program.

Upon graduation and completion of the Advanced Course, selected students for flying or line assignments will be offered commissions as Second Lieutenants in the Air Force Reserve. Reserve Officers who desire lifetime careers in the Regular Air Force may apply for regular appointments after serving on active duty for one year. Cadets who maintain a high academic and aptitudinal average are eligible for designation as Distinguished AFROTC Cadets and later Distinguished AFROTC Graduates. A designee, if fully qualified, may apply for a regular commission upon graduation.

The Summer Session

THE SUMMER SESSION at Duke University makes available to Duke undergraduate students and to undergraduates from other universities and colleges a notable program of instruction in many fields of knowledge both academic and professional.

Undergraduates in Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending two or more summer sessions.

Undergraduates from other colleges and universities may enjoy the special advantages of summer instruction at Duke and transfer their earned credits to their own institutions.

The Summer Session of 1965 will include two terms: Term I, June 12 to July 17; Term II, July 19 to August 24. By attending both terms it is possible for a student to earn as many as twelve semester hours of credit.

Instruction of interest to undergraduates will be offered in the summer of 1965 in the following departments and colleges: Botany; Chemistry; Economics and Business Administration; Education; Nursing; Engineering; English; Forestry; French; Geology; German; Greek; Health and Physical Education; History; Latin and Roman Studies; Mathematics; Philosophy; Physics; Political Science; Psychology; Religion; Sociology; Spanish; and Zoology.

Distinctive features of Summer Session instruction are provided by the program in marine biology offered at the Duke Marine Laboratory, Beaufort, North Carolina, and by various conferences in several of the Departments.

While the basic purpose of the Summer Session is to serve the academic and the professional requirements of those who are interested in their own educational advancement, the University recognizes the need of, and provides for, a varied recreation program both athletic and social.

Undergraduates of Duke University, both men and women, who plan to attend the Summer Session should enroll with the Dean of their own college in Duke University. Undergraduates in other universities or colleges who seek transfer credits should apply directly to the Director of the Summer Session, Duke University, Durham, North Carolina.

Financial Information

THE prospective student who seeks the optimum opportunity in higher education will not be a bargain hunter. Certainly, some sound plan for paying the cost of college must be devised, but this plan should be formulated after the thoughtful selection of an institution has been made. No college or university can honestly say that an education at the college level is inexpensive. Most university people and the ever growing college alumni families across our nation, however, will reflect the feeling that the benefits derived from a college education constitute a handsome return on the dollars invested.

Each student going to college should analyze carefully his financial situation. In making such analysis it should be recognized that the primary responsibility for defraying the cost of an education lies with the student and his family. The typical college student can depend upon some contribution from his family's current income, a proportionate share of family savings, and anticipated income from summer employment. The number of years of study contemplated and the number of dependent children in the family should be considered in computing the funds which will be available in a particular year.

Fees paid by the students cover only a part of the cost of their instruction and of the operations of the University. Income from endowment and contributions from the alumni, alumnae, and other public-spirited men and women meet the balance, which constitutes more than half the total cost.

ESTIMATED EXPENSES FOR AN ACADEMIC YEAR

Certain basic expenditures are to be considered in preparing a student's budget, such as tuition, the general fee, room and board. The necessary expenditures together with a reasonable amount allotted for miscellaneous items such as laundry, organizational dues, and sundry purchases are shown as follows:

Undergraduate Men		*Undergraduate Women*	
Tuition	$1,250.00	$1,250.00	
General Fee	187.00	187.00	
Room Rent	250.00	275.00	
Board	500.00 (Cafeteria estimate)	450.00	(Board Rate)
Books and Supplies	70.00	70.00	
Miscellaneous Expenses	443.00 (Moderate estimate)	443.00	(Moderate estimate)
Totals	$2,700.00	$2,675.00	

Miscellaneous expenses beyond the moderate estimate given above depend to a large extent upon the tastes and habits of the individual. It is realistic to suggest that the average Duke student, however, can plan on a budget of $2,700.00 for the academic year. Travel costs, clothing purchases, and other major expenditures would have to be added to this estimate.

Tuition and Fees

The tuition of $625.00 and the general fee of $93.50 are due and payable not later than the day of registration for a particular semester. After the day of registration no refund of the tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

New students, on notification of acceptance, are required to pay a non-refundable first registration fee of $20.00 and to make a deposit of $50.00. The $50.00 deposit will not be refunded to accepted applicants who fail to matriculate. For those who do matriculate, $25.00 of the deposit serves as a continuing room deposit for successive semesters, and the remaining $25.00 as a continuing registration deposit. Arrangements for refund of the $25.00 room deposit are described in information furnished each resident student by the Housing Bureau. The $25.00 pre-registration deposit will be refunded to students (1) whom the University does not permit to return, (2) who graduate, or (3) who request the refund at the time of pre-registration, thus indicating their intention not to return for the following semester. The pre-registration deposit will not be refunded to students who pre-register and fail to enter the following semester on schedule.

Students who have been readmitted to the University after an absence of one or more semesters, on notification of readmission, are required to make the $50.00 room and registration deposits.

An Air Force ROTC deposit of $20.00 is required of students enrolling in Air Science to cover possible loss of military equipment issued to them. This deposit is refunded to the student upon return of issued equipment.

Living Accommodations

As the undergraduate colleges of the University are resident institutions, all students are required to live in the residence halls. Any exceptions must be approved by the Dean of Men or the Dean of Women. Rooms are not rented for a shorter period than one semester. No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds are made in accordance with the University's established schedule.

Accommodations on the West Campus for Students of Trinity College and the College of Engineering

Upon their admission to Trinity College or the College of Engineering men students are sent detailed information by the University Housing Bureau concerning their obligations under the housing contract. Undergraduates occupy Wannamaker Hall and Craven, Crowell, Few, and Kilgo Quadrangles. The houses in Kilgo and part of Crowell are reserved for members of the freshman classes. Each of these units has a resident Head Housemaster and one or more Housemasters. A limited number of Freshmen reside in other houses where they live in community with upperclass students and a Fellow, a Faculty member or an advanced graduate student who serves as their adviser.

In the residence houses for undergraduate men the rental charge for a single room is $300.00 for the academic year or $150.00 for each semester; for a double room the charge is $500.00 for the academic year or $250.00 for each occupant, or $125.00 per semester for each occupant.

The dining facilities on the West Campus include three cafeterias, with multiple-choice menus, and the Oak Room where full meals and *a la carte* items are served. The cost for the academic year ranges from $500.00 upward depending upon the taste of the individual.

Accommodations on the East Campus for Students of The Woman's College

All residence houses of The Woman's College—Addoms, Alspaugh, Aycock, Bassett, Brown, Gilbert, Giles, Jarvis, Pegram, and Southgate—have both single and double rooms. These houses are alike in their organization. In each of them there is a resident House Counselor, who is a member of the Dean's staff, and full representation from all four classes, the appropriate number of places being reserved each year for freshmen.

The two additional, smaller housing units are located in the Faculty Apartments. One of them is assigned to the French Corridor where qualified upperclassmen can gain experience in speaking the language and can share their interests in French literature, culture, and customs. A native French woman serves this group as resident Faculty Associate. French is spoken exclusively in this area and at the French Table in the dining halls where residents of the Corridor have their evening meals.

The other smaller housing unit in the Faculty Apartments is assigned to the Experimental Dormitory group. This group has a flexible house structure designed to permit the fullest development of the diverse interests and intellectual concerns of its members. It is advised by a resident Faculty Associate.

In the residential units of The Woman's College the rental charge for a single room is $325.00 for the academic year or $162.50 for each semester. The rental charge for a double room is $550.00 for the academic year or $275.00 for each occupant, or $137.50 per semester for each occupant. Detailed information concerning the student's obligations under the housing contract is published in the Woman's College Handbook.

The dining halls in which all resident students have their meals are located in the Woman's College Union and in Gilbert-Addoms residence hall. The charge for board is $225.00 per semester, payable at the time of registration. If a student withdraws during the first six weeks of the semester, a board refund is made on a *pro rata* basis; if withdrawal occurs after that time, no refund is allowed.

Because of the large number served in the dining halls, it is not possible to arrange special diets for individual students.

Other Information

In the regular academic year students who register for no more than two courses with a maximum credit of 8 semester hours are classified as special students. They are charged a registration fee of $5.00 for each course and $42.00 for each semester hour of course credit. Registration for 9 or more semester hours, or 3 or more courses, requires payment of full fees.

Auditing of one or more courses without charge is allowed students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for not less than 3 nor more than 8 semester hours may audit other courses by payment of $21.00 for each course audited.

In order to encourage its employees in their professional and personal advancement, Duke University will permit full-time employees who are paid on a monthly basis to take one or two courses, but not more than seven semester hours and will charge $5.00 per course plus $21.00 per semester hour.

One transcript is issued free of charge. Additional copies are supplied at $1.00 each.

No records are released and no student is considered by the faculty as a candidate for graduation until he has settled with the Bursar for all indebtedness.

Bills may be sent to parents or guardians provided the Bursar has been requested in writing to do so. Failure to pay bills on or before the due dates will debar the student from class attendance until the account is settled in full.

Financial Aid

Duke University is interested in students with ability and ambition. It is the aim of the University Financial Aid Committee and others affiliated with the Financial Aid Program to provide, insofar as possible, the financial assistance required by students accepted for entrance who are unable to defray the cost of college from their own resources. The assistance is made available in the form of scholarships, grants-in-aid, loans and part-time employment.

In 1964-65 financial aid totaled $1,558,000. Of this amount $926,324 was allotted to 1,116 undergraduate students in the form of scholarships, grants-in-aid, and remissions of tuition; $231,700 in student loans, and approximately $400,000 through part-time employment on the campus and in the city of Durham and the surrounding area.

Freshmen students shared proportionately in this aid: 338 received awards totaling $301,062 in direct assistance not including loans or part-time employment.

SCHOLARSHIPS: All requests for applications for scholarships, grants-in-aid, industry scholarships or remissions of tuition should be addressed to the Office of Admissions, Duke University, Durham, North Carolina.

All candidates for scholarships and grants-in-aid must submit an official Application for Admission to the University and the Application for Scholarship to the office of Admissions. Scholarship candidates who desire to be considered for the maximum value of scholarships on the basis of financial circumstances are required to submit the "Parents' Confidential Statement" of the College Scholarship Service. The "Parents' Confidential Statement" may be obtained from high school principals or upon request from the Admissions Office.

Scholarship candidates should initiate their applications during the fall semester of their senior year of study in secondary schools. Instructions concerning the specific requirements and deadline dates will accompany the application materials sent to applicants for scholarships and grants-in-aid.

Awards annually available to undergraduate students at Duke University fall into eight major categories. These are:

(1) *Angier B. Duke Memorial Scholarships:* Recipients of these awards are students whose superior records mark them as young men and young women who give outstanding promise of becoming leaders in their chosen fields of endeavor.

Number available: 31 for each Freshman class.

Value: To $2,600.00 annually.

(2) *W. N. Reynolds Memorial Scholarships:* Recipients of these awards are students of outstanding ability, superior records and the promise of constructive leadership. In considering candidates for the awards, first consideration will be given to:

1. Children of employees of R. J. Reynolds Tobacco Company or any of its affiliates or subsidiaries.
2. Children of families residing in Forsyth County, North Carolina.
3. Other candidates who are residents or natives of North Carolina.

(3) *Duke University School of Nursing Scholarships:* Recipients of these awards are young women whose superior records indicate outstanding promise of becoming leaders in the profession of Nursing.

Number available: 11 for each Freshman class.
Value: $200 to $1,400.00 annually.

(4) *Huguenot Scholarship:* A scholarship of $1,000.00 per year is available from the Huguenot Society of America to a decendant of a Huguenot ancestor.

(5) *Grants-in-Aid:* Recipients of these awards are able students who need financial assistance in order to meet the cost of attending college.

Number available: Approximately 400 annually.
Value: From $100.00 to $1,500.00 annually.

(6) *Remissions of Tuition:* Children of ministers in the North Carolina and Western North Carolina Conferences of the Methodist Church who are resident in the conference and children of ministers of all faiths residing in Durham County are eligible to receive a remission of the tuition charge for a maximum of eight semesters of undergraduate study at Duke University.

(7) *Tuition Grant:* Tuition grants are available to children of certain qualified staff members of Duke University for a maximum of eight semesters of undergraduate study at Duke University.

(8) *Corporate Scholarships:* Certain scholarships financed by private corporations are available annually to undergraduate students at Duke University. The selection of the recipients of these awards is made by the University Scholarship Committee. These scholarships are assigned to students whose records of scholarship and leadership are outstanding and whose financial need can be demonstrated.

Number available: 18.
Value: $500.00 to $2,000.00 annually.

CHRISTIAN VOCATIONS SCHOLARSHIPS: Students preparing to enter full-time religious work are eligible to apply for special consideration on the basis of need. These students will be required to submit the "Parents' Confidential Statement." Students with need will be recommended by the Director of Financial Aid to the Christian Vocations Scholarship Committee which will consider the intention of the applicant. Students approved by the Christian Vocations Scholarship Committee are required to sign a note each semester for the amount of financial assistance granted to them by the University Scholarship Committee. These notes will be cancelled upon evidence that the student has entered full time Christian work after graduation. Pre-ministerial and religious education students ranking in the upper quarter of their graduating classes are encouraged to apply for an Angier B. Duke Memorial Scholarship.

AWARDS FOR FOREIGN STUDENTS: A limited number of awards will be made each year to qualified students from other countries who are accepted by the Office of Admissions as entering freshmen or as students with advanced standings. Candidates for these awards are required to submit the "Application for Scholarship" and the "Parents' Confidential Statement" of the College Scholarship Service provided by Admissions Office of Duke University.

STUDENT LOANS: Students who have completed at least one semester in residence and who have satisfactory academic and citizenship records are eligible to apply for student loans. Loan funds held in trust by the University as well as funds supplied by the federal government through the National Defense Education Act of 1958, are available to qualified students.

Loans generally mature after borrowers have left the University. Loan interest on long term loans from University funds accrues at the rate of 1% from the date of each note. After a student has left the University permanently, the loans begin bearing interest at the rate of 3% per annum. The balance unpaid after five years bears interest at the rate of 6% per annum.

In addition to local loan funds, Duke University participates in the student loan program established under the provisions of the National Defense Education Act of 1958. Repayment of loan funds under the National Defense Education Act of 1958 normally begins one year after the student terminates his education at the University, with complete repayment scheduled within a ten-year period. Interest accrues at the rate of 3% commencing one year after the borrower ceases to be a full-time student at an institution of higher education. Special benefits to those teaching in the public schools permit a portion of the loan to be cancelled depending upon the length of teaching service. Complete details regarding the student loan program may be obtained by writing directly to the Student Loan Office.

The Student Loan Committee in approving loan applications selects those students who, from the standpoint of character, scholastic attainment, personality and degree of financial need, are deserving of this consideration. A student in residence may not, without special permission, own or operate a car during the academic year for which the loan is granted. Loan applications must be submitted not later than July 1, preceding the academic year for which assistance is requested.

STUDENT EMPLOYMENT: The Financial Aid Office maintains an employment office to serve students who need part-time jobs. There are many opportunities both on the campus and in the city of Durham. A considerable number of students each year help defray their college expenses by working.

Those students accepted for admission to Trinity College and the College of Engineering in need of part-time employment should apply to Financial Aid Office, Duke University, Durham, North Carolina. Students in the Woman's College should apply to the Assistant Dean of Undergraduate Women, 108 East Duke Building, Duke University, Durham, North Carolina.

Medals and Prizes

THE achievements of undergraduate students are recognized in various fields of college activity. The following prizes suggest the range of the recognition:

The *Debate Council* authorizes the awarding of medals to members of the graduating class who have represented the University in at least two intercollegiate debates. The medals are given by the local chapter of the Tau Kappa Alpha Fraternity.

The *Robert E. Lee Prize* is the gift of the late Reverend A. W. Plyler, of the class of 1892, and Mrs. Plyler. The sum of $50 is awarded annually at Commencement, preferably to that member of the senior class of Trinity College or the College of Engineering who, in character and conduct, in scholarship and athletic achievement, in manly virtues and capacity for leadership, has most nearly realized the standards of the ideal student. The Vice-President in the Division of Student Life, the Graduate Director of Athletics, and the President of the Student Council constitute a committee to draft and adopt regulations governing the award.

Alpha Kappa Psi Medallion. Beta Eta Chapter of Alpha Kappa Psi, a professional fraternity in commerce, awards annually the Alpha Kappa Psi Scholarship Key to the male senior student pursuing a degree in the Department of Economics and Business Administration who has attained the highest scholastic average for three years of collegiate work in this University.

Medal of the North Carolina Association of Certified Public Accountants. The North Carolina Association of Certified Public Accountants annually awards a medal to the senior who, in the judgment of his instructors, is the most outstanding student in accounting in his graduating class.

Julia Dale Prize in Mathematics is a prize of books given annually to the undergraduate who shows the greatest proficiency in the study of calculus.

The Milnow Prize consists of a certificate of award and a one year's payment of dues in the American Institute of Electrical and Electronic Engineers for the membership year in which the honoree is awarded his baccalaureate degree. It is awarded annually to that student from North or South Carolina graduating in the Department of Electrical Engineering who, in the opinion of the faculty of that department and as shown by his grades, has made the most progress in electrical engineering during his last year in college.

The George Sherrerd III Memorial Award in Electrical Engineering was established in 1958 by the parents of George Sherrerd III, a graduate of the class of 1955, to recognize outstanding undergraduate scholarship. This award, consisting of the income from a fund of $5000.00 is made annually to that senior student in Electrical Engineering who, in the opinion of the Electrical Engineering faculty, has attained the highest level of scholastic achievement in all subjects and simultaneously has rendered significant service to the College of Engineering and the University at large. The recipient's name is inscribed on a plaque displayed in the Engineering Building.

The Charles Ernest Seager Memorial Award, established in 1958 by the widow and friends of Charles Ernest Seager, a graduate of the class of 1955, recognizes outstanding achievement in the annual Student Prize Paper Contest of the Duke Branch of the American Institute of Electrical and Electronic Engineers. The award consists of inscribing the name of the contest winner on a plaque displayed in the Engineering Building.

The American Society of Civil Engineers Prize consists of a certificate of award and a one year's payment of dues in the American Society of Civil Engineers. Awards are made annually by the North Carolina Chapter to the two outstanding seniors in civil engineering based on the recommendation of the faculty of the Civil Engineering Department. The basis for selection is the student's scholastic record, his contribution to the Student Chapter, and his participation in other college activities and organizations.

The Tau Beta Pi Prize. The North Carolina Gamma chapter of Tau Beta Pi, engineering national honor society, awards each year a suitable prize, such as an engineering handbook, to a sophomore student in engineering for outstanding scholastic achievement during the freshman year.

The Phi Lambda Upsilon Prize. Phi Lambda Upsilon, honorary chemical society, yearly awards a suitable prize to an outstanding junior who is majoring in chemistry. The recipient's name is inscribed on a plaque displayed in the Chemistry Library.

The Pegram Chemistry Club Prize is awarded in the spring of each year for scholarship in chemistry, physics, and mathematics. The prize consists of a one-year junior membership in the American Chemical Society and a one-year subscription to either the *Journal of the American Chemical Society* or *Industrial and Engineering Chemistry.* To qualify for this prize, the student must (1) be enrolled as an undergraduate of Duke University and (2) be taking or have taken a fourth-year chemistry course. The winner of this prize is selected by a committee consisting of at least one faculty member and at least two members of the Pegram Chemistry Club; the selection is based on the

quality-point average for all courses taken in chemistry, physics, and mathematics. In case of a tie equal awards are given.

The James B. Rast Memorial Award in Comparative Anatomy is given annually by the parents of James Brailsford Rast in memory of their son, a member of the class of 1958 at Duke University. The award, consisting of the *Atlas of Descriptive Human Anatomy* by Sobotta and bearing the James B. Rast Memorial bookplate, is given to the student who demonstrates the greatest achievement in the study of Comparative Anatomy.

The Erasmus Club Prize in the Humanities. The Erasmus Club is composed of a group of Duke faculty members interested in research in language, literature, and the arts. It seeks to stimulate interest and study in these fields. To encourage undergraduate students in this field, the Erasmus Club has established an annual prize amounting to $25.00, for the best original essay by an undergraduate which embodies the results of research, criticism, or evaluation in some subject in the humanities. Prospective competitors should consult a professor in their major field. Essays must be typewritten and must be submitted to the president of the club before the first of April. The Club reserves the right to withhold the prize in case there are no essays of acceptable quality.

The Anne Flexner Memorial Award in Creative Writing has been established by the family and friends of Anne Flexner, who graduated from Duke in 1945. It consists of fifty dollars in cash and a number of books chosen by the student. The award is given annually for the best piece of creative writing submitted by a Duke undergraduate. The competition is limited to short stories (5,000-word limit), one-act plays (5,000-word limit), poems (100-line limit), and informal essays (3,000-word limit). Only one manuscript may be submitted by a candidate, and it must be delivered to the English Office, Room 325 Allen Building, before April 15.

The William Senhauser Prize is given by the mother of William Senhauser in memory of her son, a member of the Class of 1942, who lost his life in the Pacific Theatre of War on August 4, 1944. The award is made annually to the sophomore or junior in Trinity College or the College of Engineering who has made the greatest contribution through participation and leadership in intramural sports. The winner of this prize is chosen by a committee selected by the President of the University.

The *Friends of Duke University Library* offer three prizes in an annual contest open to all undergraduate students for the best book collections acquired during their college year. The contest is supervised by the Undergraduate Committee of the Friends of the Library, which announces each fall the terms of the award. Inquiries may be directed to the Curator of Rare Books. Collections entered in the

contest are exhibited each spring in the General Library. The prizes are awarded on the basis of the student's collection, a personal interview to determine the overall planning and objectives of his collecting activity, and his familiarity with his own books and the general field of his collecting interest.

The William T. Laprade Prize in History in honor of William T. Laprade, who was a member of the History department at Trinity College and Duke University from 1909 to 1953, and chairman of the department from 1938 to 1952. This prize is awarded to that senior who is graduating with distinction and whose senior essay in history has been judged unusually meritorious.

Algernon Sydney Sullivan Award. This award is provided by the New York Southern Society. Three awards may be made each year: one to a member of the senior class of Trinity College or the College of Engineering, one to a senior in the Woman's College, and one to a member of the staff of the University or the community. "In the selection of the recipients nothing shall be considered except the possession of such characteristics of heart, mind, and conduct as evince a spirit of love for and helpfulness to other men and women."

General Academic Regulations

Trinity College and Woman's College

QUANTITY CREDIT AND COURSE LOAD: The unit of credit used is the semester hour, which signifies one class period a week throughout the semester. Two or three hours of laboratory work are equivalent to one hour of class work. Two semesters of seventeen weeks each constitute the academic year. For the degree of Bachelor of Arts or Bachelor of Science, credit for 124 semester hours is required.

Selected superior students are given the opportunity to earn credit for independent study and research in programs approved and supervised by the faculty.

The normal load for an undergraduate student is four or five academic courses totaling 14 to 17 semester hours, exclusive of physical education. The maximum number permitted is 19 semester hours, exclusive of physical education. No student is permitted to take less than 14 semester hours of work without special permission from the Dean or to take more than the normal load of work unless his average grade in the preceding semester is higher than C.

COURSE AUDIT: With the consent of the instructor, the student is allowed to audit one or more courses in addition to the normal load. After the first week of classes in any semester, no student classified as an auditor in a particular course may take the course for credit, and no student taking a particular course for credit may change classification to an auditor. Under no circumstances may a student repeat for credit any course he has previously audited. Auditors submit no daily work, take no examinations, and receive no credit for courses.

QUALITY CREDIT: The requirements for the degree are computed in semester hours and in quality points. Quality points are determined by grades as follows: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points. Credit for at least 248 quality points is required for the degree of Bachelor of Arts or Bachelor of Science.

REQUIREMENTS FOR CONTINUATION IN COLLEGE AND FOR GRADUATION FROM COLLEGE: To continue in college students must, in addition to the requirements listed elsewhere (see page 34) in this *Bulletin,* pass a minimum number of semester hours,

achieve a specified quality point ratio (q.p.r.), and earn a minimum number of quality points. The quality point ratio is calculated by dividing the accumulated number of quality points earned by the accumulated number of semester hours carried (not semester hours passed). These are minimum requirements for continuation in college, but do not guarantee that the student will be permitted to remain. These requirements are listed in the following table:

For continuation from	The minimum requirement is
The first to the second year	18 s.h. credit and a q.p.r. of 1.30
The second to the third year	42 s.h. credit and a q.p.r. of 1.60
The third to the fourth year	66 s.h. credit and a q.p.r. of 1.70
The fourth to the fifth year, if needed	90 s.h. credit and a q.p.r. of 1.80

For graduation the minimum requirement is 124 s.h., 248 q.p. and a q.p.r. of 1.90. Students of the senior class, in order to be eligible for graduation, must complete the work of their senior year with a minimum average grade of C.

CLASS STANDING: To rank as sophomores, students must have to their credit at least 26 semester hours and 52 quality points; as juniors, at least 56 semester hours and 112 quality points; and as seniors, at least 90 semester hours and a quality point ratio of 1.80.

Seniors may not take for graduation credit any course open primarily to freshmen without the recommendation of the Director of Undergraduate Studies of their major department and the approval of the Dean. Juniors may not take for graduation credit more than one course open primarily to freshmen without a similar recommendation and approval.

Seniors who at the beginning of a semester lack no more than 9 semester hours for the fulfillment of the requirements for the A.B. or B.S. degree may enroll, with the approval of the Dean of the Graduate School, in graduate courses for a maximum total program of fifteen hours a week.

College of Engineering

QUANTITY CREDIT AND COURSE LOAD: The unit of credit used is the semester hour, which signifies one class period a week throughout the semester. Two or three hours of laboratory work are equivalent to one hour of class work. Two semesters of 17 weeks each constitute the academic year. For the degree of Bachelor of Science in Engineering, credit for a minimum of 142 semester hours is required.

The normal load is 16-19 semester hours, exclusive of physical education. No student is permitted to take less than 14 semester hours of work without special permission from the Dean or to take more than the normal load of work unless his average grade in the preceding semester is higher than C.

QUALITY CREDIT: The requirements for the degree are computed in semester hours and in quality points. Quality points are

earned by a student on the basis of his grades: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points.

REQUIREMENTS FOR CONTINUATION IN COLLEGE AND FOR GRADUATION: To continue in college and to graduate, a student must, in addition to the requirements listed elsewhere in this Bulletin, pass a minimum number of semester hours and achieve a specified quality point ratio (q.p.r.). The quality point ratio is based solely on work performed at Duke and is calculated by dividing the total number of quality points earned by the total number of semester hours attempted at Duke. These requirements are listed in the following table:

For continuation from	The minimum requirement is
The first to the second year	18 s.h. credit and a q.p.r. of 1.30
The second to the third year	48 s.h. credit and a q.p.r. of 1.60
The third to the fourth year	78 s.h. credit and a q.p.r. of 1.70
The fourth to the fifth year, if needed	108 s.h. credit and a q.p.r. of 1.80

For graduation the minimum requirement is 142 s.h., a q.p.r. of 1.90, and a q.p.r. of 2.00 in senior work. A minimum average grade of C in all courses taken in the last year, combined with all courses designated for the senior year in the particular engineering curriculum.

ACADEMIC CLASS STANDING: *To be classified as a sophomore,* a student must have to his credit at least 22 semester hours and must have passed certain specially designated courses of the freshman engineering curriculum. *To be classified as a junior,* he must have to his credit at least 62 semester hours and must have passed certain specially designated courses of the sophomore departmental engineering curriculum. *To be classified as a senior,* he must have to his credit at least 102 semester hours and must have passed certain specially designated courses of the junior departmental curriculum.

Trinity College, Woman's College, and College of Engineering

REGISTRATION DAY: All pre-registered undergraduate students are required to return to the University on Registration Day for each semester and to report to their Dean's Offices. All students are cautioned to plan their return to the University so as to allow ample time to report to their Dean's Offices. Failure to be cleared for classes by 6:00 p.m. on Registration Day will cause students to forfeit their $25.00 registration deposits and their places in each class for which they pre-registered.

RESIDENCE REQUIREMENTS: The final four semesters—or equivalent—of work must be earned in residence except in those

instances in which a student has been approved to take his junior year abroad. For engineering students, 30 of these 60 semester hours must be from those normally taken in the senior year. Students who meet this requirement but who still lack 6 to 8 semester hours in final fulfillment of requirements may take this work in another institution of approved standing, provided the course is approved by the chairman of their major department and by the dean.

Students who complete in a summer session the work required by the University for the Bachelor's degree will be granted the degree at the end of the summer.

DISMISSAL: In addition to the qualitative standards listed above students must pass a minimum number of hours each semester. Freshmen must pass at least 6 semester hours of work in their first semester, 9 semester hours in the second semester (in engineering 3 required courses), and 18 semester hours in their first year; all other students must complete and pass at least 9 semester hours each semester. Physical education credits are excluded in each case. The University may require a student whose record is considered unsatisfactory to withdraw, although he has met the minimum requirements set forth in this paragraph.

GRADING: Final grades are reported to indicate passing or failing work in designated courses. Final grades are:

(1) *Passing.* Passing grades are A, exceptional; B, superior; C, average; and D, low pass.

(2) *Failing.* A grade of F indicates that the student has failed the course and that in order to receive credit for the course he must repeat the work in class.

Special symbols are used to indicate the following:

(1) *Absence from the final examination.* In all cases in which the student is absent from a final examination, he receives an X instead of a final grade. If he does not present an acceptable explanation for his absence to the appropriate dean's office within forty-eight hours after the scheduled time for the examination, the X is converted to an F. A student absent from examination, if the absence has been excused by the Dean, may receive an examination upon payment of a fee of $5.00 to the Treasurer of the University. The instructor concerned arranges for examination in cases where absences are excused. An X not cleared by the end of the semester following the examination missed is converted to an F.

(2) *Incomplete work.* If because of illness or other emergency a student's work in a course is incomplete, he may receive an I for the course instead of a final grade. Incomplete courses must be completed before the close of the succeeding semester; otherwise, the I is con-

verted to an F and the course must be repeated in class if the student is to receive credit for it. In case a student whose work is incomplete is also absent from a final examination, he receives an X for the course.

(3) *Withdrawal.* The letter W is used to indicate official withdrawal from a course. If a student drops a course without permission from the Dean, the grade for that course is recorded as F. If he drops with permission a course in which he is failing, the grade for that course is recorded as F unless, in the judgment of the Dean, circumstances do not justify this penalty.

(4) *Continuing course.* The letter Z is used to indicate that the student has completed one semester of a two-semester course. A final letter grade is given at the completion of both semesters of the course.

REPORTS: Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, six-weeks advisory grade reports on freshmen are mailed each semester.

ATTENDANCE REGULATIONS: The attendance regulations specifically place the responsibility for class attendance upon the individual student. A student is expected to attend his classes regularly and punctually. It should be recognized that one of the most vital aspects of a residential college experience is attendance in the classroom, and that the value of this academic experience cannot be fully measured by testing procedures alone. The members of the student body are considered sufficiently mature to appreciate the necessity of regular attendance, to accept this personal responsibility, and to demonstrate the kind of self-discipline essential for such performance; and, conversely, to recognize and accept the consequences of failure to attend. Instructors are privileged to refer to the dean for appropriate action any student who in their opinion is causing his work or that of the class to suffer because of absences or latenesses.

Absences from required classes due to illness will be excused when certified by a proper medical official. Absences from required classes due to authorized representation of the University may be excused. Officials in charge of groups representing the University are required to submit names of those persons to be excused to the appropriate dean's office forty-eight hours in advance of the hour when their absences are to commence.

EXAMINATIONS: Final examinations are held in all subjects in January and May.

TRANSFER CREDIT: Transfer credit, in which grades of C or above have been earned, is rated at two quality points per semester hour. Courses in which grades of less than C have been earned are not acceptable for transfer credit.

Credit for work completed at other institutions will be determined in relation to the curriculum requirements of the college in which the student enrolls at Duke.

Credit for courses in science or language offered for advanced standing in any of the undergraduate colleges by a transfer from a junior college will be determined by the departments concerned.

The maximum amount of credit acceptable from a junior college is 60 semester hours, exclusive of physical education. No credit is given for work completed by correspondence, and credit for no more than six semester hours is allowed for extension courses.

RECIPROCAL AGREEMENT WITH THE CONSOLIDATED UNIVERSITY OF NORTH CAROLINA: Under a plan of co-operation between the Consolidated University of North Carolina and Duke University, students regularly enrolled in the Consolidated University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester at Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students at Duke University may be admitted to course work at the Consolidated University of North Carolina.

Academic Honors

DEAN'S LIST: In recognition of academic achievement, students who earn an average quality point ratio of 3.0 or higher on a semester's work of not less than the minimum academic load are placed on the Dean's List.

CLASS SCHOLARS: The five students in each combined undergraduate class of the University (including Trinity College, The Woman's College, and the College of Engineering) who achieve the highest quality point ratio on at least a normal course load for each academic year shall be designated Class Scholars.

CLASS HONORS: To be eligible for Class Honors a student must earn, during the year, credit for at least the minimum academic load permitted by the college in which he is registered. Students in the freshman, sophomore, and junior classes who earn a 3.50 quality point ratio on all work for the year are eligible for Class Honors.

GRADUATION HONORS: To be eligible for consideration for Graduation Honors a student must have completed in residence a minimum of ninety semester hours. Students who earn an average of at least a quality point ratio of 3.50 are recommended for a degree *magna cum laude.* Those who earn a quality point ratio of 3.75 are recommended for a degree *summa cum laude.*

Honors and Other Special Programs

ADVANCED PLACEMENT: The colleges have arranged for course placement on the basis of good performance on either the Advanced Placement Examinations of the CEEB or—to a more limited extent—on placement tests given by the colleges during Orientation Week. The College Board Advanced Placement Examinations are a vehicle to sophomore-level or higher placement in botany, chemistry, English, French, German, history, Latin, mathematics, physics, Spanish, and zoology, while the Duke tests are used to decide such placement only in foreign languages and mathematics. A further distinction is that only the AP Examinations may lead to credit toward graduation for the course or courses omitted. The departmental directors of undergraduate study and the University Registrar are charged with the responsibility for evaluations leading to advanced placement of freshman matriculants.

Advanced Placement Examinations are given in May by the College Entrance Examination Board. Information regarding the tests may be obtained from the Board.

ADVANCED PLACEMENT COURSE CREDIT: Any student who has earned a score of 3 or higher on an Advanced Placement examination of the CEEB and is approved for placement in a sophomore-level course or above may be considered for course credit in appropriate subjects. For those presenting scores of 4 or 5 the award of credit will be made automatically upon matriculation; for those presenting scores of 3 it will be determined with the approval of the University department concerned, no earlier than the end of the first semester. Course credit may be granted for one or two semesters in each subject area in which examination is offered in the Advanced Placement Program.

GRADUATION WITH DISTINCTION: Programs featuring independent study and other honors opportunities are available under the title Graduation with Distinction in the majority of the academic departments. Although the details and requirements of the program vary from department to department, certain general requirements are uniform. Each department participating invites, at the end of their junior year, those students who have maintained at least a "B" average in the major field and an over-all average of "B" to enter the Graduation with Distinction Program. After participation in a senior seminar, and/or a directed course of reading, laboratory research, or other independent study, the student must embody the results of his individual research and study in a distinguished piece of writing. The paper is assessed by a departmental committee which,

if it approves, recommends that the student be Graduated with Distinction in his major field.

INDEPENDENT STUDY: Students who have a 3.0 quality point ratio overall and in their major may be permitted to enroll for independent study during their junior and senior years. The courses, numbered 191, 192 and 193, 194, are designed to permit students to pursue individual research and reading in a field of special interest subject to the supervision of a member of the staff. A student need not be in a Graduation with Distinction program to enroll in independent study courses. The maximum credit allowed for independent study and honors research courses is 3 semester hours per semester during the junior year and 6 semester hours per semester during the senior year. Interested students should consult the Director of Undergraduate Studies in the department in which they wish to work.

HONORS-MASTERS PROGRAM: This program, which is made possible partly by a grant from the Ford Foundation's Fund for the Advancement of Education, aims at the recruitment and accelerated preparation of college and university teachers. Academically superior undergraduates are selected by the Honors-Masters Committee during the spring of their sophomore year. During the junior year, these pregraduates are enrolled in Colloquium 101, 102; normally the pregraduates will be candidates for graduation with distinction in their major departments. Emphasis is also placed on the acquisition of reading knowledge of two satisfactory foreign languages prior to the beginning of graduate work. Summer school scholarships as well as a limited number of first-year graduate scholarships are available.

DISTINGUISHED PROFESSOR SEMINARS: Interdisciplinary one-semester seminars of restricted enrollment, offered to upperclassmen will be led by senior members of the faculty, usually holders of named chairs. Professors and topics are announced under the title *University Courses.* (See page 134.) Because of their scope the seminars lie outside any particular major though a department may, at its discretion, accept one or more of them as related work. Each carries three semester hours credit.

Juniors and seniors with overall averages of at least 2.75 who meet prerequisites listed for particular seminars may apply for a seminar through the Dean of their College. Preference is given to juniors and to those not enrolled in a senior honors seminar. The selection of seminar groups is made by the moderators.

READING-OUT OF INTRODUCTORY COURSES: The option to "read" in order to by-pass introductory or pre-requisite courses is open to students of demonstrated academic ability to allow them to advance at their own pace to upper-level work. This opportunity

ensures a richer program for the student who has few places in his curriculum for electives. Any student interested in reading during the summer to by-pass an introductory or pre-requisite course must be recommended by his dean and secure the permission of the department concerned. Reading for a course and auditing are mutually exclusive procedures. A proposed program of reading should be approved by the director of undergraduate studies in the department in which the work will be done. On passing a three-hour qualifying examination prepared by the department a student may be certified for advanced course work in the area. On certification an entry will be made on his permanent record that he has passed a qualifying examination but no course credit is awarded. Interested students should request further information from their respective Dean's Offices.

STUDY ABROAD: A student contemplating study abroad should be guided by the following provisions established by the Undergraduate Faculty Council and administered by the Committee on Study Abroad.

The student should

(a) have a scholastic average of at least 2.5 (recommended);
(b) obtain prior permission to study abroad from major adviser and academic dean;
(c) receive certification from the foreign language department concerned that he can handle adequately the language of the country where he will study, provided that the language be taught at the freshman-sophomore level at Duke;
(d) obtain in advance, wherever possible, approval of his program of studies from major adviser and academic dean.

If the student wishes to transfer credit to Duke and

(a) is participating in a program sponsored by an American group, the group must have been approved by the above committee and the program he proposes must meet the qualifications of the sponsoring group

or (b) studies abroad under his own sponsorship, work to be considered for transfer must be done in the language in which courses are normally given in the institutions attended.

SUMMER STUDY ABROAD. Duke University, in co-operation with the Experiment in International Living, runs a summer program of study abroad in France, Germany, and Spain, open to all qualified Duke students. The program offers the opportunity to earn 6-8 hours of academic credit. Participants are selected by the Committee on Study Abroad and the Experiment in International Living. Applications must be submitted before February 15 to qualify for the following summer group.

Other Regulations

CONDUCT AND DISCIPLINE: The University expects of its students loyal and hearty cooperation in developing and maintaining high standards of conduct as well as of scholarship. General University regulations concerning conduct of students are made available to students when admission is offered, or upon request. The student in accepting admission indicates his willingness to subscribe to those regulations. The University reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory to the University, even though no specific charge may be made against the student.

General oversight of the conduct of students and the administering of discipline are under the supervision of appropriate deans. Immediate supervision is entrusted to the Dean of Men and the Dean of Women. However, through the expressed willingness of the students of the University to assume the responsibility of maintaining high standards of morality, the student body has become to a great degree self-governing. Two councils, one of men and the other of women, each composed of duly elected representatives of the student body, exercise the authority granted the students by their respective colleges to investigate all cases of misconduct, as well as all other cases of violation of proper standards and traditions, and to make recommendations of penalities based on their finding. They exert a guiding and stimulating influence for the promotion of high ideals of conduct among students.

MOTOR VEHICLES: Freshmen are not permitted to own or operate motor vehicles at the University. In accordance with University regulations members of the upper classes of Trinity College and the College of Engineering and seniors in the Woman's College may operate motor vehicles.

Students permitted to operate motor vehicles must register them annually at the beginning of the fall semester, or if the vehicle is acquired later, within five days after bringing it to the campus. Students must show a state vehicle registration and a state operator's license. A standard certificate of automobile liability insurance, issued by a recognized company and evidencing coverage of at least $5,000 per person and $10,000 per accident for personal injury and $5,000 for property damage is also required. There is a registration fee of $30.00 per vehicle for each academic year.

Students under 21 years of age must have the written consent of parent or guardian before operating a motor vehicle at Duke.

SCHOLASTIC REGULATIONS FOR PARTICIPATION IN ATHLETICS AND OTHER ACTIVITIES: Members of athletic teams or other student groups engaging in public representation of the University are expected to be carrying their current work satisfactorily. Students may be barred from participation in such representation if, in the opinion of the dean of their college, they fail to meet this requirement.

ENROLLMENT AND REGISTRATION: Students in residence are required to submit, not later than the date of the spring registration, cards showing their selection of courses for the following year. Evidence of the payment of the continuing pre-registration deposit of $25.00 (see page 20 for detailed information) is required before the card may be submitted. These cards are filed for permanent record in the Central Records Office. Students who do not select their courses for the following year at the appointed time must be readmitted to the college by application to the Director of Admissions. Each student planning to continue enrollment for the following year must apply for a room or obtain permission to live off campus prior to the end of the spring semester. Students whose course cards have been approved in the spring may enroll by mail during the summer. The same regulations, with the exception of the advanced deposit, apply to registration for the spring semester.

Students who register in either semester at a date later than that prescribed in the Calendar of the Colleges must pay to the Treasurer a fee of $5.00. (See attendance regulations, page 35.) Changes in courses for reasons not arising within the University require a payment of $1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

READMISSION OF FORMER STUDENTS: A student who desires to return, following withdrawal from college, should apply to the Director of Admissions, and send a detailed statement of his activities since withdrawal. If practicable, the student should arrange for an interview with the Dean of his college.

TRANSCRIPTS: Requests for transcripts should be directed to the Office of the Registrar. Ten days should be allowed for processing. One transcript is issued free of charge. Additional copies are supplied at $1.00 each.

Requirements for Degrees

DUKE UNIVERSITY offers in Trinity College and the Woman's College, courses of study which lead to the degrees of Bachelor of Arts and Bachelor of Science; and in the College of Engineering, the degree of Bachelor of Science in Civil, Electrical, or Mechanical Engineering.

Bachelor of Arts

The requirements for the degree of Bachelor of Arts are based on the principle that the student will derive the maximum benefit from his college work if his program includes a broad distribution of studies among representative fields of culture, concentration within a special field, and some work of his own choice.

For graduation with the degree of Bachelor of Arts, the following course work must be completed in accordance with the academic regulations as stated in this *Bulletin.*

Uniform Course Requirements	s.h.
English	6
Foreign Language	6–18
Natural Science	8
Formal Science	3
Religion	6
Social Science and History	12
Humanities	12
Physical Education	4
Major and Related Work	42
Electives to Make a Total of	124

These requirements are described in detail below.

ENGLISH, 6 s.h.—This requirement is met by the completion of English 1-2.

FOREIGN LANGUAGE.—The languages which meet this requirement are French, German, Greek, Latin, Russian, and Spanish. This requirement is fulfilled by one of the following: 1.) a passing grade in French 64, German 92 or equivalent, Greek 106 or 108, Latin 92, Russian 64 or Spanish 64; 2.) a satisfactory score on the placement test, plus a validating year (two literature courses numbered 90 or above); 3.) passing a proficiency examination. (The proficiency examination can be taken only by students who have been enrolled in language work in the University and is not available to entering Freshmen.) Students presenting for entrance four units of Latin may satisfy the language requirements by the completion of the third college year of Latin or two years of Greek.

Students enrolled during the fall of 1962 in a language course numbered 63 or above are controlled by the regulations published in the 1960-61 *Bulletin.*

NATURAL SCIENCE, 8 s.h.—To satisfy this requirement a student must complete a laboratory course in one of the natural sciences (botany, chemistry, geology, physics, or zoology).

FORMAL SCIENCE, 3 s.h.—One course of at least 3 semester hours selected from mathematics (except Mathematics 11), logic and scientific methodology (Philosophy 48, 103 and 104).

RELIGION, 6 s.h.—This requirement may be met in one of the following ways: (a) by completing, in the freshman year, Religion 1-2; (b) by completing, in the sophomore year or later, Religion 51-52; (c) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99.

SOCIAL SCIENCE AND HISTORY, 12 s.h.—To satisfy this requirement a student must complete 12 semester hours in two departments from the following basic courses: Economics 51-52; Education 54-104; History 1-2, or 51-52; Political Science 11-12, or 61-62; Psychology 91, to be followed by either Psychology 100 or 101; Sociology 91-92, or 93-94. (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

HUMANITIES, 12 s.h.—To satisfy this requirement a student must complete 12 semester hours from the following courses, with six hours in each of two divisions: (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

I. Literature: English 55-56, 57-58; Greek 121, 122; Latin 111, 112; all foreign language literature courses above 100 not given in translation.
II. Philosophy 41-42, 93-94.
III. Art and Music: Art 1-2, 51-52; Music 1-2, 51-52.

PHYSICAL EDUCATION, 4 s.h.—Physical education is required during each of the first two years and is normally completed by the end of the sophomore year.

MAJOR IN RELATED WORK, 42 s.h.—Prior to registration in the spring of his sophomore year, each student is required to choose his major field and confer with his departmental adviser about the requirements for major and related work.

The major work consists of 18 to 24 semester hours in one department above the introductory courses. Introductory courses consist of two one-semester courses in all departments except the departments of Economics and Business Administration, German, Latin, Music, and Romance Languages, in which the introductory courses may consist of four one-semester courses. The choice of courses must be approved by the major department. Whenever the department defines the major as 24 hours above the introductory courses, the student, with the prior approval of the Director of Undergraduate Studies, may substitute 6 hours of advanced work normally taken by a major in a related discipline during his junior or senior year. Eighteen hours of related work must be taken in at least two other departments and is selected subject to the approval of the major department and the dean of the appropriate college; it may not include more than one course of 6 or 8 semester hours open primarily to freshmen. With the consent of the department, however, majors in mathematics, the natural sciences, and science education may include as related work introductory courses in mathematics and the natural sciences. Although courses satisfying the uniform course requirements may also be counted toward the requirements in major and related work, no student may satisfy two uniform course requirements with the same course.

ELECTIVES.—In addition to the uniform courses required and the major and related work, other courses must be completed to make a total of at least 124 semester hours, including 4 semester hours of physical education.

Students whose courses of study permit may elect a maximum of 18 semester hours in engineering, forestry, or medical science. The courses elected in these subjects must be approved by the major department and the dean of the appropriate college.

CHOICE OF A MAJOR FIELD

The requirement of 42 semester hours distributed, as specified above, between a major field and related work is based primarily on the belief that some advanced study in one subject, together with work in allied subjects is a valuable part of a general education. The

selection of a major field usually depends on a student's cultural or vocational interests.

GENERAL PROGRAM

The General Program is designed for the student whose primary interest is in one of the liberal arts subjects. The subjects in which major work is offered are: art, botany, chemistry, economics, education, English, French, geology, German, Greek, history, Latin, mathematics, music, philosophy, physics, political science, psychology, religion, Russian, sociology, Spanish, zoology.

SPECIALIZED PROGRAMS

A student who has chosen a particular field may wish to take more course work in a major or related discipline than is required by his major department. The following programs of study offer a guide in planning this work, especially as it applies to preparation for various professions or professional schools.

Undergraduate Programs

Accounting: A student may specialize in public or industrial accounting in his Junior and Senior years. In either case the following courses should be taken in the Freshman and Sophomore years:

Freshman Year: Mathematics 17 or 21. (Preferably Mathematics 21)
Economics 1 and 2
Sophomore Year: *Economics 51-52, 57-58, 138
* If Economics 1 and 2 not taken in Freshman year.

Public Accounting

The following sequence of courses includes more than the requirement for a major in accounting. It is, however, a suggested list of courses which meet the current requirements of the North Carolina Board of Certified Public Accountants.

Junior Year

Ec. 143—Corporation Finance
Ec. 146—Managerial Economics
Ec. 171—Accounting Theory
Ec. 172—Corporate Accounts
Ec. 181—Business Law
Ec. 182—Business Law

Senior Year

Ec. 273, 274—Auditing Theory and Practice
Ec. 275, 276—Advanced Industrial Accounting and Management
Ec. 277—Income Tax Accounting
Ec. 295—Advanced Accounting Seminar

Election of one of the following: (either year)

Ec. 178—Accounting Systems
Ec. 180—Governmental Accounting
Ec. 184—Commercial Law for Accountants
Ec. 278—Advanced Problems in Income Taxation
Ec. 279—Budgeting and Control
Ec. 296—Advanced Accounting Seminar

Industrial Accounting

Junior Year	*Senior Year*
Ec. 143—Corporation Finance	Ec. 273—Auditing, Theory and Practice
Ec. 146—Managerial Economics	Ec. 275, 276—Advanced Industrial Accounting and Management
Ec. 171—Accounting Theory	Ec. 277—Income Tax Accounting
Ec. 172—Corporate Accounts	Ec. 291—Business Policy

Business: A specialized program is offered to students planning to enter business. A student electing this program must take, in addition to the uniform course requirements, the following courses in the sequence indicated.

Freshman Year:	Mathematics 17 or 21 (Preferably Mathematics 21) Economics 1 and 2
Sophomore Year:	Economics 51 and 52 (If Economics 1 and 2 not taken in Freshman year) Economics 57, 58, Economics 138
Junior Year:	Economics 143, Economics 146, *Economics elective
Senior Year:	*Economics Elective, Economics 291

* These electives must be chosen from the following courses:
Economics 144, Economics 185, Economics 190, Economics 249

Music Education: The following course sequence is designed for prospective teachers of high school instrumental or vocal music. Although it includes more than the number of hours required for a major in music, it represents those courses recommended by the Music Department for state certification: Music 51-52, 65-66, 115-116, 121-122, 147-148, 3 additional semester hours in Music Literature, and 18 semester hours in Applied Music.

Other areas of concentration in music are described on pages 101-106 of this *Bulletin*.

Teaching: Duke University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers.

The program for students who intend to teach is designed to prepare for positions either in elementary or secondary schools. All prospective teachers must take Psychology 91, preferably during the sophomore year, and Education 100 or 113 preferably during the junior year. Only students with an average of 2.0 overall and in their major or teaching fields will be admitted to student teaching. Special methods courses should be taken prior to undergraduate student teaching, which may be done *only* in the senior year.

Whatever their majors, students should consult an appropriate member of the Department of Education prior to each registration period to assure their meeting the certification requirements of the states in which they wish to teach and having places reserved for them in student teaching.

Elementary-School Teaching. Students preparing to teach in the

elementary school must complete the following specific requirements in addition to Psychology 91 and Education 100 or 113: Education 101, 102, 105, 106, 107, 108, 118, and 161; Art 51-52; Economics 115 or 120; History 91, 92; Music 151, 152; Health Education 134; Political Science 61; and Physical Education 102.

Secondary-School Teaching. Students preparing to teach in a secondary school may meet certification requirements by qualifying in one teaching subject, but they are strongly advised to choose courses that meet requirements in two teaching subjects. Prospective secondary-school teachers must major in a subject other than education. Qualification for certification to teach a single science may be sought under either the A.B. or the B.S. degree.

Science Education Major. Students who intend to teach sciences in the high school may major in Science Education. The program is designed to meet certification requirements and to provide the broad background of preparation in the sciences which is needed by science teachers. Students planning to enter this program should consult an adviser in the Department of Education and in one of the science departments. The basic requirements are: Education 100, or 113, 118, 215, 216, and 276 or 246; Mathematics 21 and 22; Sciences (botany, chemistry, geology, physics, zoology, and mathematics above 22), 42 s.h., of which 15 must be above introductory level and which must include one year's study in laboratory courses in three of the following: botany or zoology, chemistry, physics, and geology.

The same major program may be followed under the B.S. uniform course requirements leading to a B.S. degree.

Preparation for Graduate and Professional Schools

Many graduate and professional schools require special tests for students seeking admissions. Information regarding the test requirements should be obtained from the catalogue of the schools to which the student plans to apply. The University Counseling Service has available applications for required graduate and professional testing programs.

Graduate School: The student who plans to enter a graduate school of arts and sciences for advanced study should consult an adviser in the field of the proposed advanced study concerning suitable preparation. Most graduate schools have definite requirements in foreign languages for all students. Candidates for the degree of Doctor of Philosophy are required to pass reading examinations, usually in German and French. In some cases other languages may be substituted. As soon as practicable, the student should ascertain the requirements of the particular graduate school he desires to enter.

Medical and Dental Schools: Students planning to enter a medical or dental school should arrange their programs of study from the first semester so as to include those courses required by the professional schools of their choice. These courses usually include two years of English, two years of chemistry, and one year each of biology, mathematics, and physics. At Duke University the courses normally taken are English 1-2 and 55-56, Chemistry 1, 2, 61, 151, and 152, Zoology 1 and 2, Mathematics 21-22, and Physics 41-42. Most professional schools require ninety semester hours of college credit before consideration for admission. Because individual medical and dental schools strongly recommend, or, in some case, require specific courses in addition to those listed above, it is wise for the student to be fully aware of any additional requirements established by the professional school of his choice.

The minimum uniform course requirements and those of the major and its related work for either the A.B. or B.S. degree must be fulfilled for graduation. The latter requirements are described for each department under Courses of Instruction in this *Bulletin*. Each student may elect to major in the department of his choice, but should understand that even with careful program planning starting his first semester, it may be necessary to exceed the 124 semester hours required for graduation.

The pre-professional student usually registers for the following program during his first year:

English 1-2.
Mathematics 21-22.
*Two laboratory sciences.
†Uniform requirement.
Physical Education 1-2.

Law Schools Students who plan to prepare for Law School may select their major work in any field. The following courses are recommended:

Economics 51-52, 57, 58.
English 55-56.
History 1-2 or 51-52, 105-106.
Philosophy 48 and 41.
Political Science 61-62.
Sociology 91-92.

Theological Schools and Religious Work: A student who plans to enter the ministry or follow some other professional Christian vocation should have a broad liberal arts background. Recommended majors are English, history, philosophy, religion, and one of the social

* The student planning to enter medical or dental school who elects only one laboratory science should begin the foreign language sequence the first year.

† Programs of the first two years should normally be completed with courses which fulfill minimum uniform requirements. Electives are limited and should be postponed until late in the program.

sciences. It is desirable that the student include the following in his program:

English: 12-18 s.h. (including English 55, 56).
History: 6-12 s.h.
Philosophy: 6-12 s.h. (including Philosophy 93, 94).
Social Sciences (other than history): 6-12 s.h.

These suggestions are in harmony with the recommendations of the American Association of Theological Schools for undergraduate courses of study.

Bachelor of Science

For graduation with the degree of Bachelor of Science, the following course work must be completed in accordance with the academic regulations as stated in this *Bulletin*.

Uniform Course Requirements	s.h.
English	6
Foreign Language	8–24
Mathematics	6
Natural Science	8
Social Science and History	6
Religion	6
Humanities	6
Physical Education	4
Major and Related Work	48
Electives to Make a Total of	124

These requirements are described below.

ENGLISH, 6 s.h.—This requirement is met by the completion of English 1-2.

FOREIGN LANGUAGE.—Bachelor of Science candidates must complete the second college year, or equivalent as determined by examination, of one foreign language, and the first college year of another. The languages submitted will be determined by the major department. Students enrolled, during the fall of 1962, in a language course numbered 63 or above are controlled by the regulations published in the 1960-61 *Bulletin*.

MATHEMATICS, 6 s.h.—This requirement may be met by completion of Mathematics 21 and 22.

NATURAL SCIENCE, 8 s.h.—This requirement can be satisfied by courses in one of the natural sciences, namely, botany, chemistry, geology, physics, and zoology. The courses must include laboratory work.

SOCIAL SCIENCES AND HISTORY, 6 s.h.—This requirement can be satisfied by either of the following 6-hour sequences; Economics 51-52; Education 54-104; History 1-2, or 51-52; Political Science 11-12 or 61-62; Psychology 91, to be followed by either Psychology 100 or 101; Sociology 91-92, or 93-94. (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

RELIGION, 6 s.h.—This requirement may be met in one of the following ways: (a) by completing, in the freshman year, Religion 1-2; (b) by completing, in the

sophomore year or later, Religion 51-52; (c) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99.

HUMANITIES, 6 s.h.—This requirement can be satisfied by 6 hours from the following: English 55-56, 57-58; Greek 121, 122; Latin 111, 112; all foreign language literature courses above 100 not given in translation; Philosophy 41-42, 93-94; Art 1-2, 51-52; Music, 1-2, 51-52. (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

PHYSICAL EDUCATION, 4 s.h.—Physical education is required during each of the first two years and is normally completed by the end of the sophomore year.

MAJOR AND RELATED WORK, 48 s.h.—Major and related work consists of at least 48 semester hours in the natural sciences. This work must be selected from the departments of botany, chemistry, geology, mathematics, physics, psychology, and zoology. The major work consists of a minimum of 18 semester hours in one department above the introductory courses. The choice of courses is subject to the approval of the department. Whenever the department defines the major as 24 hours or more above the introductory courses, the student, with the prior approval of the director of undergraduate studies, may substitute 6 hours of advanced work normally taken by a major in a related discipline during his junior or senior year. The related work is taken in at least two other departments and is selected subject to the approval of the major department. With the consent of the department, majors in mathematics and the natural sciences may include as related work introductory courses in mathematics, the natural sciences, and science education. A minimum of 14 semester hours of related work is required, 8 hours of which must be in laboratory science. Although courses fulfilling the uniform course requirements may also be counted toward the requirements in major and related work, no student may satisfy two uniform course requirements with the same course. For the major in science education leading to the B.S. degree, see p. 46.

ELECTIVES.—In addition to the above, the student must elect sufficient courses to complete the 124 semester hours necessary for graduation.

Students whose courses of study permit may elect a maximum of 18 semester hours in engineering, forestry, or medical science. The courses elected in these subjects must be approved by the major department and the dean of the college.

On or before the date announced for the spring registration, every sophomore in this group should select his major department in the natural sciences and arrange, under the guidance of an adviser in the major department, his program of studies for the following year. He should obtain the adviser's written approval of all courses selected in the division before submitting his program to the dean for final action. In like manner, each upperclassman will recheck the courses in his division of concentration each year with a representative of his major department.

Bachelor of Science in Civil, Electrical, or Mechanical Engineering

The College of Engineering offers fully accredited four-year programs in civil, electrical, and mechanical engineering leading to the degrees of B.S. in C.E., B.S. in E.E., or B.S. in M.E.

GROUPS OF STUDIES FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL, ELECTRICAL, OR MECHANICAL ENGINEERING

The engineering curricula are undergoing thorough restudy and re-evaluation, hence the three programs which follow are subject to modification for the academic year 1965-66.

§*Uniform Freshman Year*

FIRST SEMESTER			S.H.	SECOND SEMESTER			S.H.
Chem	1	Gen. Inorg. Chemistry	4	Chem	2	Gen. Inorg. Chemistry	4
Engrg	1	Engineering Design I	2	Engrg	2	Engineering Design II	2
Engl	1	English Composition	3	Engl	2	English Composition	3
Hist	1	Modern History	3	Hist	2	Modern History	3
Math	21	Introductory Calculus	3	†Math	22	Introductory Calculus	3
PE		Physical Education	1	PE		Physical Education	1
			*16				*16

Civil Engineering

Sophomore Year

FIRST SEMESTER			S.H.	SECOND SEMESTER			S.H.
†CE	61	Surveying	5	CE	72	Materials Laborarory	1
Engrg	57	Statics	3	†Engrg	107	Mechanics of Materials	3
Math	63	Intermediate Calculus	3	Engrg	109	Mech. of Materials Lab.	1
Phys	41	General Physics	4	Engl	93	Technical Communication	3
‡Approved Elective			3	Math	64	Intermediate Calculus	3
PE		Physical Education	1	Phys	42	General Physics	4
			19	‡Approved Elective			3
				PE		Physical Education	1
							19

Junior Year

FIRST SEMESTER			S.H.	SECOND SEMESTER			S.H.
CE	118	Engrg. Materials	2	CE	113	Route Surveying	2
†CE	131	Structural Mech. I	3	†CE	123	Hydraulic Engrg.	3
Engrg	115	Dynamics	3	CE	133	Reinforced Concrete	3
Engrg	128	Fluid Mechanics	3	EE	123	EE Fundamentals	3
ME	103	Thermodynamics	3	EE	125	EE Fundamentals Lab.	1
ME	116	ME Laboratory	1	‡Approved Electives			6
‡Approved Elective			3				18
			18				

Senior Year

FIRST SEMESTER			S.H.
CE	101	Soil Mech. Lab.	1
CE	124	Sanitary Engrg.	3
CE	132	Structural Design	4
CE	135	Soil Mechanics	2
CE	146	Professional Engrg.	2
‡Approved Electives			6
			18

SECOND SEMESTER			S.H.
CE	116	Transportation	3
CE	140	Structural Mechanics II.	3
CE		Elective	3
‡Approved Electives			9
			18

§There is a single, common program in the Freshman Year; final choice of a department is not made until the time of registration for the sophomore year.

†Courses which must be passed before engineering academic standing can be advanced.

*Freshman engineering students taking Air Science or Naval Science will schedule certain courses in addition to the 16 semester hours prescribed for each semester.

‡Part of a program of 30 semester hours of electives planned with departmental approval to suit the interests and abilities of each student. The program will include three semester hours of mathematics beyond calculus; an additional nine semester hours in mathematics, the sciences, or other technical subjects; and another 15 semester hours in the humanities or the social sciences, including six semester hours of either economics or political science.

A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering All other credits earned in Air Science and Naval Science are taken in addition to the minimum program.

ELECTRICAL ENGINEERING

Sophomore Year

FIRST SEMESTER			S.H.
Econ	51	Principles of Economics	3
EE	53	E. E. Fundamentals	1
EE	55	Electric Networks I	4
Engl	93	Technical Communication	3
Math	63	Intermediate Calculus	3
Phys	41	General Physics	4
PE		Physical Education	1
			19

SECOND SEMESTER			S.H.
Econ	52	Principles of Economics	3
†EE	56	Electric Networks II	4
Engrg	60	Engineering Mechanics	4
Math	64	Intermediate Calculus	3
Phys	42	General Physics	4
PE		Physical Education	1
			19

Junior Year

FIRST SEMESTER			S.H.
EE	109	Electromagnetic Systems	4
EE	111	Electrical Prin. Lab.	2
Engrg	107	Mechanics of Materials	3
Math	111	Applied Math Analysis I	3
Phys	161	Modern Physics	3
‡Approved Elective			3
			18

SECOND SEMESTER			S.H.
†EE	110	Electromagnetic Systems	4
EE	112	Electrical Prin. Lab.	1
Engrg	128	Fluid Mechanics	3
Math	112	Applied Math Analysis II	3
ME	103	Thermodynamics	3
ME	116	M. E. Laboratory	1
‡Humanities-Social Studies Elective			3
			18

Senior Year

FIRST SEMESTER			S.H.
EE	165	Seminar	1
EE	181	Electronic Networks	3
EE	183	Electronics Laboratory	1
EE	191	Electric Machinery	3
EE	193	Energy Conversion Lab.	1
‡EE Elective			3
‡Approved Elective			3
‡Humanities-Social Studies Elective			3
			18

SECOND SEMESTER			S.H.
EE	166	Seminar	1
EE	182	Electronic Networks	3
EE	184	Electronics Laboratory	1
EE	192	Electric Machinery	3
EE	194	Energy Conversion Lab.	1
‡Approved Elective			3
‡Approved Elective			3
‡Humanities-Social Studies Elective			3
			18

†Courses which must be passed before engineering academic standing can be advanced.

‡Part of a planned program of electives to be chosen in consultation with the adviser. A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering. All other credits earned in Air Science and Naval Science are taken in addition to the minimum program.

MECHANICAL ENGINEERING

Sophomore Year

FIRST SEMESTER			S.H.
Engrg	60	Engineering Mechanics	4
Math	63	Intermediate Calculus	3
ME	52	Kinematics Kinetics	3
Phys	41	General Physics	4
‡Humanities-Social Studies Elective			3
PE		Physical Education	1
			18

SECOND SEMESTER			S.H.
Engrg	107	Mechanics of Materials	3
Engrg	109	Materials Laboratory	1
†Math	64	Intermediate Calculus	3
ME	105	Dynamics of Fluids	3
Phys	42	General Physics	4
‡Humanities-Social Studies Elective			3
PE		Physical Education	1
			18

Junior Year

FIRST SEMESTER			S.H.
EE	123	Fundamentals of E.E.	3
EE	125	Elec. Fundamentals Lab.	1
Math	111	Applied Math Analysis I	3
ME	101	Thermodynamics	3
†ME	106	Heat Transfer	3
ME	141	Machine Design	3
‡Humanities-Social Studies Elective			3
			19

SECOND SEMESTER			S.H.
EE	124	Industrial E. E.	3
EE	126	Industrial Elec. Lab.	1
Engl	93	Technical Communication	3
Math	112	Applied Math. Analysis II	3
†ME	102	Thermodynamics	3
ME	114	M. E. Laboratory	2
†ME	142	Machine Design	3
			18

Senior Year

FIRST SEMESTER			S.H.
Econ	51	Principles of Economics	3
ME	59	Materials and Processes	3
ME	159	M. E. Laboratory	1
ME	171	Response of Phys. Systems	3
ME	173	Seminar	1
ME		Elective	3
‡Approved Electives			6
			20

SECOND SEMESTER			S.H.
ME	156	Combustion Engines	3
ME	160	M. E. Laboratory	1
ME	162	Power Plants	3
ME	174	Seminar	1
‡Approved Electives			6
‡Humanities-Social Studies Elective			3
			17

†Courses which must be passed before engineering academic standing can be advanced.

‡The electives form a planned program to be chosen in consultation with the adviser. A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering. All other credits earned in Air Science and Naval Science are taken in addition to the minimum program.

Academic-Professional Courses

The provision whereby a senior may elect the work of the first year in a professional school of the University shall apply solely to eligible students in Trinity College or the Woman's College. The privilege of completing a combined course for the degree is conditioned upon admission to the professional school at the close of the junior year. A student thus admitted registers as a senior in college and as first-year student in the professional school.

ACADEMIC-FORESTRY COMBINATION

Pre-professional training in forestry is offered to students of Trinity College who are planning careers in professional forestry. A student who has completed the 3-year program of students in the liberal arts and sciences outlined below, and who has earned an average grade of C or higher (exclusive of physical education) may, with the approval of the Deans of Trinity College and the School of Forestry, respectively, transfer to the School of Forestry. Upon the satisfactory completion of the forestry course requirements in the Summer Session, and those required in the first year in the School of Forestry (see *Bulletin of the School of Forestry*) the student will be eligible for the degree Bachelor of Science from Trinity College, Duke University.

The professional degree of Master of Forestry may be earned upon satisfactory completion of the work of the second year in the School of Forestry.

Students wishing information concerning admission to the School of Forestry are invited to consult with the Chairman of the Committee on Admissions of that school.

The program of studies in preparation for admission to the School of Forestry under this combination program includes the following:

	S.H.
Uniform Course Requirements for the B.S. Degree	48–66
Additional Required Courses	24–26
Electives to Make a Total of	94
Summer Field Work	12

Uniform Course Requirements: These requirements are described in the Requirements for the Bachelor of Science degree in this *Bulletin.* French, German, Russian, or Spanish may be used to fulfill the foreign language requirement. The natural science requirement is met by completion of Botany 1-2. The social science and history requirement is met by completion of Economics 51-52.

Additional Required Courses:

	S.H.
Chemistry 1-2	8
Engineering Drawing 1-2	4
Geology 51	4
Physics 1-2	8
	24

Electives: The electives are normally chosen from botany, chemistry, economics, mathematics, and philosophy. A minimum of 94 semester hours must be obtained, exclusive of summer field work, to meet uniform course requirements, additional required courses, and electives.

Summer Field Work: This work of 11 weeks, to be taken upon completion of the junior year, includes:

	S.H.
Dendrology (F. 141)	3
Forest Surveying and Aerial Photo Interpretation (F. 150)	4
Forest Mensuration (F. 151)	4
	11

Trinity College students in this combination are encouraged to consult with the special adviser for students in Academic Forestry Combination. The name of this adviser may be obtained at the School of Forestry office.

ACADEMIC-LAW COMBINATION

A student who has completed, with an average grade of C or higher, 96 semester hours of undergraduate work, including the uniform course requirements for the degree of Bachelor of Arts and the work of the junior year in his major and related fields, may, with the approval of the dean of the college, transfer to the Duke University School of Law and be eligible for the degree of Bachelor of Arts from Duke University upon the satisfactory completion therein of the work of the first year.

It is understood that this provision shall apply solely to eligible undergraduates who have completed three years in residence in Duke University, and that not less than the full first-year's work of the Law School will be acceptable for credit towards the bachelor degree.

No single discipline or program of study can be described as the best preparation for the study of law since there are various methods of approach to legal study.

Completion of the undergraduate work necessary to qualify for the Academic-Law Combination does not insure admission to the Duke University School of Law, nor impose any restriction whatever upon its freedom in selecting students for admission. Students wishing further information are invited to consult with the Dean of the School of Law.

Courses of Instruction

Trinity College and the Woman's College

NOTE: Courses primarily for freshmen are numbered from 1 to 49; those primarily for sophomores are numbered from 50 to 99; those primarily for juniors and seniors from 100 to 199; those primarily for seniors and graduates from 200 to 299. The amount of credit for each course is given in semester hours following the description of the course.

The designation of (W) or (F) indicates that the course is to be given on the West Campus or on the East Campus. Odd-numbered courses are usually offered in the fall semester; even-numbered courses in the spring semester. *For courses which will be offered in 1964-65, consult the Official Schedule of Courses available to enrolled students in the Registrar's Office.*

Double numbers separated by a hyphen indicate that the course is a year-course and must normally be continued throughout the year if credit is received. A student must secure written permission from the instructor in order to receive credit for either semester of a year-course. Double numbers separated by a comma indicate that although the course is a year-course credit may be received for either semester without special permission.

AEROSPACE STUDIES

PROFESSOR SCHLÖGL, LT. COLONEL, USAF, CHAIRMAN; ASSOCIATE PROFESSOR OLDHAM, MAJOR, USAF, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSOR WILSON, MAJOR, USAF

ELIGIBILITY REQUIREMENTS.—Freshmen enrolled in Trinity College and the College of Engineering are eligible to enroll in the Basic Course in the Air Force ROTC. For enrollement in the Advanced Course the student must have successfully completed either the Basic Course or the six weeks Field Training Course, or have had at least one year of honorable service in the Armed Forces of the United States; must execute a written agreement with the government to complete the Advanced Course; must be sworn into the Enlisted Reserve, and he must agree to accept a commission in the United States Air Force Reserve upon graduation

DEPOSIT REQUIRED.—Each student must make a deposit of twenty dollars with the University Treasurer to insure return of all Government Property.

COURSE OF STUDY.—The course of study of AFROTC is composed of courses in the Department of Aerospace Studies. In addition to classroom instruction, the Air Force requires Leadership Laboratory each semester.

BASIC COURSES

First Year Basic

AS 1. LEADERSHIP LABORATORY

AS 2. DEFENSE OF THE UNITED STATES.—A study of the causes of world conflict, the problem of United States security, and the role of the armed forces as instruments of national policy. 2 s.h. (W) WILSON

Second Year Basic

AS 51. WORLD MILITARY SYSTEMS.—A comparative study of free world military forces, Communist Military Systems, and trends in the development and employment of military powers. 2 s.h. (W) WILSON

AS 52. LEADERSHIP LABORATORY

ADVANCED COURSES

All students selected to continue Aerospace Studies pursue:

First Year Advanced

AS 101, 102. GROWTH AND DEVELOPMENT OF AEROSPACE POWER.—A study of development of aerospace power in the United States; mission and organization of the Defense Department; Air Force concepts, doctrine and employment; astronautics and space operations; future development of aerospace power. Leadership Laboratory is required. 6 s.h. (W) SCHLÖGL

Second Year Advanced

AS 203. THE PROBLEMS OF FLIGHT AND THE AEROSPACE SCIENCES OF WEATHER AND NAVIGATION are studied. For pilot and navigator cadets, elective for all others. 1 s.h. (W) OLDHAM

AS 205, 206. THE PROFESSIONAL OFFICER.—Studies of the principles of leadership and their professional application in combat and managerial situations. Final portion of the second semester is devoted to the Military Justice system. Leadership Laboratory is required. 6 s.h. (W) OLDHAM

ART

ASSOCIATE PROFESSOR MUELLER, CHAIRMAN, PRO TEM; ASSOCIATE PROFESSOR JENKINS, DIRECTOR OF UNDERGRADUATE STUDIES; ADJUNCT PROFESSOR BIER; PROFESSORS HALL AND PATRICK; ASSOCIATE PROFESSORS BRODERSON, MARKMAN, AND SUNDERLAND; VISITING INSTRUCTOR HANNEGAN; MESSRS. STARS AND PRATT

AESTHETICS

121. THE PRINCIPLES OF ART CRITICISM.—The development of criteria for making sound critical judgments based on analyses of painting, sculpture, architecture, and design. 3 s.h. (E) PATRICK

221-222. HISTORY OF AESTHETICS.—Theories of art and beauty in the western world from antiquity to the present. Some attention will be given the development theories of aesthetics in the Far East. 6 s.h. (E) PATRICK

HISTORY OF ART

1-2. INTRODUCTION TO ART HISTORY.—An historical survey of the development of architecture, sculpture, painting, and the minor arts as material manifestations of the culture of the western world from ancient to modern times, with some reference to primitive, Oriental, and other non-western culture; the visual arts as a record of a whole civilization. The course will provide the student with terminology and principles necessary to formation of judgment. Open only to freshmen; others, see Art 51-52. 6 s.h. (E & W) STAFF

51-52. INTRODUCTION TO ART HISTORY.—The aims of this course are identical with those of Art 1-2; the content and method are adapted to the capacities of upperclassmen. Not open to upperclassmen who have received credit for Art 1-2. 6 s.h. (E & W) STAFF

131. ART AND ARCHAEOLOGY OF THE HELLENIC WORLD.—After a preliminary treatment of the archaeological material from the Aegean, the geometric and orientalizing periods, the course deals with the architecture, sculpture and vase paintings of ancient Greece from archaic through Hellenistic times. 3 s.h. (W) MARKMAN

132. ROMAN ART AND ARCHAEOLOGY.—The course opens with a treatment of the archaeological background for the formation of the Roman style as derived from Etruscan, Greek, and indigenous Italian sources, and then deals with

the architecture, sculpture and painting from the early republic to the end of the empire in Italy, and to some extent in the provinces. 3 s.h. (w) MARKMAN

133. MEDIAEVAL ARCHITECTURE.—A survey of Christian architecture in the Near East, the Balkans, Russia, and western Europe from the beginnings of the mediaeval style in the late classical period to its disintegration in the fifteenth century. 3 s.h. (E) MISS SUNDERLAND

134. MEDIAEVAL PAINTING AND SCULPTURE.—A study of painting, including mosaics, manuscripts, stained glass, and sculpture, in western Europe from the late classical period through the fourteenth century. 3 s.h. (E) MISS SUNDERLAND

136. NORTHERN RENAISSANCE ART.—A study of book illumination, panel painting, graphic arts, and sculpture as expressions of literary, religious, and philosophical ideas of the fifteenth and sixteenth centuries in the Low Countries, Germany, and France. Some emphasis will be placed on individual artists such as the Van Eycks, Van der Weyden, Bouts, Van der Goes, Bosch, Bruegel, Grünewald, and Dürer. 3 s.h. (E) MUELLER

137. ITALIAN RENAISSANCE PAINTING AND SCULPTURE.—This course traces the evolution of painting and sculpture in Italy from the beginning of the fifteenth century through the middle of the sixteenth. Special emphasis is placed on developments in Florence, Venice, and Rome. 3 s.h. (E) MISS JENKINS

140. SEVENTEENTH CENTURY PAINTING AND SCULPTURE IN EUROPE.—This course traces the evolution of the Baroque style in European painting and sculpture with some attention being given to related manifestations in the late sixteenth and early eighteenth centuries. Particular emphasis is laid on developments in Flanders, France, Holland, and Spain. 3 s.h. (E) MISS JENKINS

141. AMERICAN ART.—A survey of architecture, sculpture, and painting in America from the time of the first settlers to the present day, including a consideration of the contributions of the English, Dutch, French, and Spanish to the artistic heritage of the United States. 3 s.h. (E) PATRICK

143. THE HISTORY OF PRINTS AND DRAWINGS.—An historical and critical study of drawings and prints from the fifteenth century to the present with reference to functions, values, and relationships to other forms such as painting, sculpture, and the book. 3 s.h. (E) MUELLER

144. RENAISSANCE AND BAROQUE ARCHITECTURE.—A study of the development of Renaissance architecture in Italy from its beginnings in the fifteenth century in the works of Brunelleschi to its flowering in the seventeenth century Baroque works of Bernini and Borromini, along with a consideration of the spread of Italian Renaissance forms to north Europe in the sixteenth century and its development into a Baroque style in the seventeenth century. 3 s.h. (E) MISS SUNDERLAND

145-146. THE RISE OF CONTEMPORARY ARCHITECTURE.—A study of the sources and evolution of the architecture of today, from the eighteenth-century conflict between Romantic Historicism and Industrialism to the work of Gropius, LeCorbusier, Wright, and their successors. 6 s.h. (E) MISS HALL

Seniors graduating at midyears may receive credit for 145, which is otherwise prerequisite to 146.

147. PAINTING AND SCULPTURE IN THE EIGHTEENTH AND NINETEENTH CENTURIES.—An investigation of the development of painting from the final stages of the Baroque in the eighteenth century to the period of the impressionist movement in the last decades of the nineteenth century. 3 s.h. (E) HANNEGAN, MISS SUNDERLAND

148. MODERN PAINTING AND SCULPTURE.—The history of European painting and sculpture from 1863 to the present day. The course investigates the rise of the anti-academic movements of Impressionism and Post-Impressionism in the latter half of the nineteenth century; their outgrowth in Cubism, Expressionism, and Surrealism; and the various abstract styles of the twentieth century. Particular emphasis is placed on such artists as Manet, Renoir, Cezanne, van Gogh, Gauguin, Seurat, Matisse, Picasso, Braque, and Klee. 3 s.h. (E) PATRICK

149. PRE-COLUMBIAN ART AND ARCHAEOLOGY.—A study of the architecture, sculpture, pottery, and other arts of the indigenous civilizations in Mexico, Central America, and the Andean region of South America before the Spanish conquest. 3 s.h. (w) MARKMAN

150. LATIN AMERICAN ART.—A study of the architecture, painting, and sculpture of Latin America from colonial times to the present. Particular emphasis will be placed on architecture of the colonial period in Mexico, Peru, and Brazil. The recent developments in mural painting in Mexico and architecture in both Mexico and Brazil will also be stressed. 3 s.h. (w) MARKMAN

191, 192. INDEPENDENT STUDY.—Open to highly qualified students by permission of the department. (See page 38.)

FOR SENIORS AND GRADUATES

217. AEGEAN ART.—A study of the problems of Aegean art as the forerunner of Greek art and in relation to the contemporary civilization of the eastern Mediterranean world. 3 s.h. (w) MARKMAN

218. EARLY GREEK ART.—A study of the problems of the origin and development of Greek art in the Geometric period to the end of the Archaic. 3 sh. (w) MARKMAN

233. EARLY MEDIAEVAL ARCHITECTURE.—The development of religious architecture from the time of Constantine to the end of the First Romanesque style in the third quarter of the eleventh century. 3 s.h. (E) MISS SUNDERLAND

234. ROMANESQUE SCULPTURE.—The development of sculpture in western Europe from the early Christian period through the culmination of Romanesque art in the west portal of Chartres Cathedral. 3 s.h. (E) MISS SUNDERLAND

239. ARCHITECTURE OF BRITAIN.—After a summary of recent archaeological activity in the British Isles, and a survey of Mediaeval building, the course deals principally with changing architectural problems and their solutions from the advent of the Renaissance onward. Attention is given to the interests of students majoring in history or literature. 3 s.h. (E) MISS HALL

240. ARCHITECTURE OF NORTH AMERICA.—A study illustrating the transplantation of European architectural customs since the sixteenth century; the time lag in transit and acceptance of later European developments; the gradual assumption of confident independence in design; and the emergence of international leaders in the United States. 3 s.h. (E) MISS HALL

292. RESEARCH PROBLEMS IN THE COLLECTIONS OF THE NORTH CAROLINA MUSEUM OF ART.—A specialized study of selected art works in the collections of the North Carolina Museum of Art. Students will meet once every week in the museum in Raleigh. In completion of the course each student will submit a report on his particular research project. 3 s.h. (E) BIER

DESIGN

Students other than art majors may receive not more than eight semester hours credit for work in studio courses. For any number of semester hours of credit in studio courses an equal number of hours must be taken in History and Criticism. The Introductory courses 1L-2L or 51L-52L are prerequisite for all courses in Design.

1L-2L. DESIGN LABORATORY.—This course aims to develop the student's visual faculty through practice with design elements and experience with media. Freshmen intending to elect further courses in Art are advised to carry this course concurrently with Art 1-2. Open only to freshmen enrolled in Art 1-2; others, see Art 51L-52L. 2 s.h. (E) BRODERSON

51L-52L. DESIGN LABORATORY.—The aims, content, and method of this course are similar to those of Art 1L-2L. Upperclassmen intending to elect further courses in Art are advised to carry this course concurrently with Art 51-52. Open only to upperclassmen enrolled in Art 51-52, and to those who have completed Art 1-2 or 51-52 without electing Design Laboratory. A senior in his last semester may receive credit for one semester. 2 s.h. (E) BRODERSON

53-54. BEGINNING STUDIO.—A studio course offering experiment and practice with formal elements of composition in various media. Particular emphasis will be given to drawing; watercolor, collage, and three-dimensional media will be secondarily considered. 4 s.h. (E) BRODERSON, PRATT

55, 56. PAINTING.—A studio course designed to give experience in painting media with individual and group criticism, and discussion of important historic or contemporary ideas in painting as related to student work. Prerequisite: Art 53-54 or consent of the instructor. 4 s.h. (E) BRODERSON, PRATT

157, 158. ADVANCED PAINTING.—Emphasis is given to the techniques of various painting and design media. Prerequisite: 55, 56. 4 s.h. (E) BRODERSON, PRATT

159, 160. PRINTMAKING.—This course presupposes a knowledge of design and skill in drawing. Practice in wood engraving; block printing; and in copperplate engraving, etching, acquatint, and drypoint. Reference will be made to prints in relation to the design of the book, and historic examples of the art of the print will be analyzed in the study of these techniques. Prerequisite: 53-54. 4 s.h. (E) MUELLER

DEPARTMENTAL MAJOR IN ART

Prerequisite: Introduction to Art History (1-2 or 51-52); or, with the approval of the Director of Undergraduate Studies, equivalent hours in 100 level courses which form a background for the History of Art.

Major Requirements: The student will select in consultation with the departmental adviser a sequence of courses emphasizing either the History of Art or Design.

a. History of Art: 24 semester hours from 100 and 200 level courses distributed over the entire field of Art History, and a concentration of courses in at least two areas.

b. Design: 22 semester hours, of which 16 must be in Design and 6 from courses in the History of Art and Theory.

Related Work: 18 semester hours elected from courses in aesthetics, anthropology, English, German, Greek, Latin and Roman Studies, history, history of music, history of religion, linguistics, philosophy, psychology, Romance Languages, and sociology.

The Department offers work leading to graduation with distinction. See the Section on honors in this *Bulletin*.

BIOLOGY

See courses listed under Botany and Zoology.

BOTANY

ASSOCIATE PROFESSOR JOHNSON, CHAIRMAN; ASSOCIATE PROFESSOR WILBUR, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSORS STONE AND WHITE, SUPERVISORS OF FRESHMAN INSTRUCTION; PROFESSORS ANDERSON, BILLINGS, HARRAR, KRAMER, NAYLOR, OOSTING, AND PERRY; ASSOCIATE PROFESSORS CULBERSON AND PHILPOTT

1. BIOLOGY OF PLANTS.—An introduction to the structure and life-processes of seed plants and the environmental factors influencing their distribution. Lectures, laboratory, discussions, and field trips. 4 s.h. (W) STAFF

2. BIOLOGY OF PLANTS.—An introduction to reproduction, heredity, and identification with emphasis on flowering plants; and an introduction to the microflora important in biological communities. Prerequisite: Botany 1. 4 s.h. (W) STAFF

52. PLANT IDENTIFICATION.—Practice in the identification of local plants and a study of the principles underlying plant classification. Laboratory, lectures, and field trips. Prerequisite: one year of botany. 4 s.h. (W) WILBUR

55. PLANT ANATOMY.—A comparative study of basic cell types, tissues and organs of vascular plants. Correlation of anatomical information with pertinent

literature, and application of anatomy to problems in systematics and evolution, and the interrelationship between structure and function. Prerequisite: one year of botany or permission of instructor. 4 s.h. WHITE

101. PRINCIPLES OF HEREDITY.—The basic principles of heredity and their significance. Lectures, three hours; laboratory, two hours; conference, one hour. Laboratory work includes experimental breeding of the fruit fly. May be taken as a lecture course without laboratory. Prerequisite: one (high-school or college) course in biology, botany, or zoology. High-school algebra or one year of college mathematics recommended. 3 (without laboratory) or 4 s.h. (w) PERRY

103. GENERAL BACTERIOLOGY.—A study of the morphology and fundamental physiological processes of bacteria: their relationship to sanitation, public health, soil fertility, and food preservation. Prerequisite: one year of botany or zoology, or equivalent. 4 s.h. (w) HUMM

105. PLANT MORPHOLOGY.—Vegetative organization and reproductive cycles of major plant group representatives. Main theories of evolutionary origin and phylogenetic interrelationships. Prerequisite: One year of botany. 4 s.h. CULBERSON

151. INTRODUCTORY PLANT PHYSIOLOGY.—The principal physiological processes of plants, including water relations, synthesis and use of foods, and growth phenomena. Prerequisite: Botany 1, 2 or equivalent; one year of chemistry recommended. 4 s.h. (w) KRAMER

156. PLANT ECOLOGY.—Principles of the relationships between plants and their environment. The structure and processes of typical ecosystems. Laboratory, lectures, and field trips. Prerequisites: Botany 1, 2 and 52, or equivalent. 4 s.h. (w) BILLINGS

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year by permission of the Department. See page 38. 6 s.h.

202. GENETICS.—The principles of heredity, their cytological basis, and their bearing on other fields of biology. Laboratory work involves experimental breeding of the fruit fly and interpretation of data from the breeding of plants. Offered in alternate years. Prerequisites: one year of botany, zoology, or equivalent, and one year of college mathematics. 4 s.h. (w) PERRY

203. PLANT CYTOLOGY.—A study of the structure and organization of plant cells in relation to growth, reproduction and especially heredity. Offered jointly with zoology. Prerequisite: one year of botany. 4 s.h. (w) ANDERSON

209. LICHENOLOGY.—Morphology, systematics, and biological and ecological implications of the lichens. Collection and identification of specimens and the use of lichen chemistry in taxonomy. Prerequisite: Two semesters of botany. 3 s.h. (w) CULBERSON

210. BRYOLOGY.—Morphological, systematic and ecological characteristics of mosses and liverworts. 3 s.h. ANDERSON

212. PHYCOLOGY.—Morphological and ecological characteristics of common freshwater and marine algae and principles of their classification. Collection, identification and preparation of permanent specimens. 3 s.h. HUMM

218. COMPARATIVE MORPHOLOGY OF VASCULAR PLANTS.—Fundamental anatomical and morphological problems and theories in relation to vascular plant evolution; emphasis on comparative vegetative and reproductive characters indicating evolutionary trends. Basic techniques in preparing materials, analyzing results and correlating with current literature. 4 s.h. WHITE

221. MYCOLOGY.—Field and laboratory study of vegetative and reproductive structures of the fungi and slime molds. Methods of collection, isolation, propagation, and identification of the major orders as represented in the local flora. Prerequisite: One year of biological science. 4 s.h. (w) JOHNSON

225, 226. SPECIAL PROBLEMS.—Students with adequate training may do special work in the following fields:

1. MYCOLOGY AND PLANT PATHOLOGY. JOHNSON
2. CYTOLOGY. ANDERSON
3. ECOLOGY. OOSTING AND BILLINGS
4. GENETICS. PERRY
5. MORPHOLOGY AND ANATOMY OF VASCULAR PLANTS. PHILPOTT AND WHITE
6. BRYOLOGY. ANDERSON
7. PHYSIOLOGY. KRAMER AND NAYLOR
8. TAXONOMY OF VASCULAR PLANTS. STONE AND WILBUR
9. BACTERIOLOGY. HUMM
10. LICHENOLOGY. CULBERSON
11. PHYCOLOGY. HUMM

240. PLANT EVOLUTION.—Microevolutionary change and factors influencing its rate and direction, with primary emphasis on examples from the plant world. 3 s.h. (w) STONE

252. PLANT METABOLISM.—The physiochemical processes and conditions underlying the physiological processes of plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 s.h. (w) NAYLOR

254. PLANT WATER RELATIONS.—A study of factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Assigned readings, reports, and lectures. Prerequisite: Botany 151 or equivalent. 3 s.h. (w) KRAMER

255. PLANT SYSTEMATICS.—A study of the historical background of plant taxonomy, modern concepts and systems of classification, nomenclatural problems, and the taxonomy of specialized groups. Prerequisite: two years of botany, including Botany 52 or equivalent. 4 s.h. (w) WILBUR

256. COMMUNITY ANALYSIS AND CLASSIFICATION.—The development of concepts and methods in synecology and their present application to the study of plant communities. Prerequisite: Botany 156 or equivalent. 3 s.h. (w) OOSTING

257. PRINCIPLES OF PLANT DISTRIBUTION.—Interpretation of floristic and ecological plant geography of world vegetation. Prerequisite: Botany 156 or equivalent. 3 s.h. (w) BILLINGS

258. PHYSIOLOGY OF GROWTH AND DEVELOPMENT.—Consideration of the internal factors and processes leading to the production of new protoplasm and its differentiation at the cellular, tissue, and organ level in plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 s.h. (w) NAYLOR

259. THE ENVIRONMENT.—Environmental principles and methods of obtaining and evaluating climatological data for ecological purposes with special attention to instrumentation and microclimate. Prerequisite: Botany 156 or equivalent. 3 s.h. (w) BILLINGS

MARINE LABORATORY.—Botany 211, *Marine Algae,* and 207, *Marine Mycology,* are given alternate years at the Duke University Marine Laboratory, Beaufort, N. C.; Botany 220, *Coastal Field Botany,* is offered biennially. Consult the *Bulletin of the Marine Laboratory.*

253. DENDROLOGY.—Nomenclature, classification, and identification of woody plants with special reference to species indigenous to southeastern United States and other important forest regions of temperate North America. Laboratory and field work. Prerequisite: one year of botany. 3 s.h. (w) HARRAR

DEPARTMENTAL MAJOR

Prerequisites: Botany 1 and 2.

Major Requirements: A minimum of 24 hours (A.B. and B.S.) of work beyond Botany 1 and 2, including at least four of the following courses: Botany 52 (Systematics), 55 (Anatomy), 105 (Morphology), 101 (Principles of Heredity), 151 (Physiology) and 156 (Ecology). The remaining hours may be selected from these and any other courses in the Department for which the student is eligible, subject to approval of the Director of Undergraduate Studies.

Related Work: Courses in at least two natural science departments sufficient to total, with major work, 42 s.h. (A.B.) or 48 s.h. (B.S.)

CHEMISTRY

PROFESSOR SAYLOR, CHAIRMAN; PROFESSOR WILDER, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSOR BONK, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS BRADSHER, BROWN, GROSS, HAUSER, HILL, HOBBS, KRIGBAUM, AND STROBEL; ASSOCIATE PROFESSORS POIRER, QUIN, AND SMITH; ASSISTANT PROFESSORS JEFFS, JONES, TOREN AND WELLS; AND ASSISTANTS

1, 2. GENERAL INORGANIC CHEMISTRY.—Lectures and recitations on the elementary principles of chemistry and on the structure, properties, preparation and uses of the elements and their compounds. The laboratory work includes qualitative analysis of some of the more common metals. One lecture, two recitations, and three laboratory hours, throughout the year. Chemistry 1 is a prerequisite for Chemistry 2. Prerequisite: Qualification for Math 21. 8 s.h. (E & W)
BONK, STAFF AND ASSISTANTS

41. ADVANCED GENERAL CHEMISTRY.—More theoretical than Chemistry 1, emphasizes atomic and molecular structure, kinetic molecular theory, chemical equilibrium, and elementary thermodynamics. Credit is not awarded for both 1 and 41. Prerequisites: Mathematics 21, may be taken concurrently, and permission of the instructor. 4 s.h. (W) STROBEL AND WILDER

42. INTRODUCTION TO CHEMICAL ANALYSIS.—An intensive study of solutions of electrolytes with special reference to chemical equilibrium. Laboratory experiments illustrate the principles of chemical equilibrium and the techniques of quantitative and instrumental analysis. Credit is not awarded for both Chemistry 2 and 42 nor for both 42 and 61. One lecture, one recitation and six laboratory hours. Prerequisites: Permission of the Director of Undergraduate Studies, Chemistry 1, and Mathematics 21. 4 s.h. (W) STROBEL AND WILDER

61. FUNDAMENTALS OF ANALYTICAL CHEMISTRY.—A study of the reactions of electrolytes in solution and of chemical equilibrium illustrated by laboratory experiments involving the techniques of gravimetric, volumetric, chromatographic, and instrumental analysis. One lecture, one recitation, and six laboratory hours. Prerequisites: Chemistry 1, 2 and Mathematics 21. 4 s.h. (W)
WILDER, JONES, POIRER, TOREN AND ASSISTANTS

70. QUANTITATIVE ANALYSIS.—A study of the theory and techniques of inorganic gravimetric and volumetric analysis. One lecture, one recitation, and six laboratory hours. Not open to B.S. Chemistry majors. Prerequisite: Chemistry 42 or 61. 4 s.h. (W) TOREN, WELLS AND ASSISTANTS

132. QUANTITATIVE AND INSTRUMENTAL ANALYSIS.—Practice in advanced quantitative analysis and in the use of physical instruments in analysis with special attention to optical devices, together with a discussion of theoretical aspects. Two recitations and six laboratory hours. Prerequisites: Chemistry 161, 162, the latter half of which may be taken concurrently. 4 s.h. (W) TOREN

151, 152. ORGANIC CHEMISTRY.—An introduction to the study of the compounds of carbon in which the chemistry of both aliphatic and aromatic compounds is considered. Laboratory experiments are selected to illustrate the more important reactions and preparations of organic compounds. Two lectures, one recitation, and three laboratory hours. Prerequisite: Chemistry 42 or 61. Chemistry 151 is prerequisite for 152. 8 s.h. (W) BRADSHER, MISS BROWN, JEFFS, QUIN, WILDER AND ASSISTANTS

161, 162. PHYSICAL CHEMISTRY.—Fundamentals of general theoretical chemistry illustrated by selected laboratory experiments. Three recitations and three laboratory hours. Prerequisites: Chemistry 152, Physics 41-42, and Mathematics 63. 8 s.h. (W) HOBBS AND SMITH

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students by permission of the department. (See page 38.)

206. ELEMENTS OF THEORETICAL CHEMISTRY.—A one semester course in the principles of physical chemistry. Credit is not given for both 206 and 161-

162. Three recitation and three laboratory hours. Prerequisites: Chemistry 70, 152, Physics 41-42, and Mathematics 22. 4 s.h. (w) SAYLOR AND JONES

215. ADVANCED INORGANIC CHEMISTRY.—A study of modern theories of valence and molecular structure and of inorganic compounds, particularly the less common types. Prerequisites: Chemistry 162 or 206. 3 s.h. (w) HILL

216. NUCLEAR CHEMISTRY.—Elementary theory of nuclear reactions, properties of isotopes, and tracer techniques. Two recitations and three laboratory hours. Prerequisites: Chemistry 70 or 132, 152, and Physics 41-42. 3 s.h. (w) HILL AND TOREN

234. CHEMICAL INSTRUMENTATION.—Discussion of physiochemical principles as applied to instrumental methods of analysis, illustrated by laboratory experiments with emphasis on methods involving electrical techniques. One lecture and three laboratory hours. Prerequisite: Chemistry 161, which may be taken concurrently. 2 s.h. (w) STROBEL

251. QUALITATIVE ORGANIC ANALYSIS.—Systematic identification of organic compounds based upon a study of physical and chemical properties. Infrared and ultraviolet absorption spectra are used in elucidation of structure. One lecture and six laboratory hours per week. Prerequisite: Chemistry 152. 3 s.h. (w) QUIN

252. ADVANCED ORGANIC PREPARATIONS.—A laboratory course designed to supplement the student's knowledge of fundamental organic processes by a selected group of laboratory exercises accompanied by discussions of techniques and theories pertinent to the experiments. Five hours laboratory and lecture with lectures in alternate weeks. Prerequisite: Chemistry 152. 2 s.h. (w) MISS BROWN

253. INTERMEDIATE ORGANIC CHEMISTRY.—An advanced study of the reactions of organic compounds and the theories of organic chemistry. Prerequisite: Chemistry 152 and permission of the Director of Undergraduate Studies. 3 s.h. (w) BRADSHER, QUIN, AND WILDER

265. INORGANIC CHEMISTRY.—An advanced study of the bonding, structures, and reactions of inorganic compounds based on modern physical chemical concepts. Three lectures. Prerequisite: Chemistry 162 or the permission of the Director of Undergraduate Studies. 3 s.h. (w) WELLS

271. INTRODUCTION TO RESEARCH.—Lectures on the use of chemical literature, research methods, recording and publication of results, and other topics. One lecture. 1 s.h. (w) MISS BROWN

275-276. RESEARCH.—A course designed to give instruction in methods used in the investigation of original problems. It is open to seniors by permission of the Director of Undergraduate Studies. 1 to 3 s.h. (w) STAFF

DEPARTMENTAL MAJOR

A. For the degree of A.B.

Prerequisites: Chemistry 1, 2, Mathematics 21, 22.

Major Requirements: 22 s.h., including Chemistry 61, 70, 151, 152, and an additional 6 to 8 s.h., which may be satisfied by 161-162 or 206 together with 2 or 3 s.h. selected from courses 216, 234, 251, and 252.

Related Work: 20 s.h., including Physics 41-42 with the remainder usually in botany, geology, mathematics, physics or zoology.

B. For the degree of B.S.

Prerequisites: Chemistry 1 or 41 and 2 or 42, Mathematics 21, 22, 63.

Major Requirements: Chemistry 61, 132, 151, 152, 161, 162, 251, 265, 271, and 216 or 234 or 252.

Related Work: 18 s.h., including Physics, 11 s.h. and Mathematics 64 or 131 or 221.

The language requirements must be satisfied by German 64 and either French 2 or Russian 2.

The department offers work leading to graduation with distinction. Consult the section on Honors and Prizes in this *Bulletin*.

CHINESE

(Elementary Chinese [101-102] is offered by the University of North Carolina, Chapel Hill. Three semester hours of credit each semester; five hours each week: three of grammar, two of oral practice. Prerequisite: junior standing.)

CLASSICAL STUDIES

PROFESSOR ROGERS, CHAIRMAN, DIRECTOR OF UNDERGRADUATE STUDIES IN LATIN; PROFESSOR TRUESDALE, DIRECTOR OF UNDERGRADUATE STUDIES IN GREEK; PROFESSORS ULLMAN AND WILLIS, ASSISTANT PROFESSORS SETTLE, STANLEY AND WOMBLE; INSTRUCTOR WOOLEY

GREEK

Courses 15, 121, 122, 131, 141, 142, 151 are entirely in English and require no knowledge of the Greek language. The purpose in offering them is to give a wider circle of students some conception of the debt which modern civilization owes to the Greeks.

1-2. COURSE FOR BEGINNERS.—Open to all students. 6 s.h. (w) Wooley

15. MYTHOLOGY.—A study of Greek mythology and the use made of it in art and English literature. No knowledge of the Greek language is required. Open to freshmen as an elective in either semester. 3 s.h. (e & w) Truesdale and Wooley

63-64. INTERMEDIATE GREEK.—Intensive review of fundamentals with emphasis on development of comprehensive reading ability. Selections from Herodotus, Xenophon, and Lysias. Open to students who have completed courses 1-2. 6 s.h. (w) Stanley

105-106. HOMER.—*Iliad,* Books I-III. PLATO.—*Apology* and *Crito.* Open to students who have completed courses 1-2 and 63-64 or their equivalent. 6 s.h. (w) Truesdale

107-108. EURIPIDES.—*Medea.* SOPHOCLES.—*Oedipus Tyrannus.* ARISTOPHANES.—*Clouds.* Open to students who have completed the required preliminary work. 6 s.h. (w) Truesdale

117-118. GREEK PROSE COMPOSITION.—The character of this course is determined by the needs of the students enrolled. 3 s.h. (w) Truesdale

121, 122. GREEK LITERATURE IN ENGLISH TRANSLATION.—The purpose of this course is to give a general survey of the life and civilization of the Greeks, especially to those who have never studied the language but wish to become acquainted with some of the choicest portions of the literature by the use of translations. It is, however, open as an elective to all juniors and seniors, whether or not they know Greek. First, the *Iliad* and the *Odyssey* are read in translation and illustrated with slides of the excavations and discoveries at Troy and other cities of the Aegean age; then, many of the extant plays of the three great tragic poets are studies in English translation. 6 s.h. (e & w) Truesdale and Stanley

Students may elect course 122, whether or not they have taken course 121.

131. HISTORY OF GREECE.—The history of the Greek world from the Late Bronze Age to the Macedonian conquest. Open to seniors, juniors, and (by arrangement) sophomores. No knowledge of Greek is required. 3 s.h. (e) Wooley

141, 142. GREEK ART.—Open to seniors, juniors, and sophomores. A comprehensive survey of the development of Greek architecture and Greek sculpture in all periods. Course 141 is opened by a preliminary account of Egyptian, Mesopotamian, and Aegean artistic backgrounds. Course 142 is devoted chiefly to Greek art of the greatest period with the main emphasis on sculpture, and may be elected independently of course 141. All lectures are fully illustrated by slides. No knowledge of Greek is required. 6 s.h. (e) Stanley

151. GREEK ARCHAEOLOGY.—A general treatment of the subject, with emphasis upon the value of archaeological discovery as evidence of the artistic development

of the Greek people. The course includes a survey of the various archaeological sites. Open to seniors, juniors, and (by arrangement) sophomores. 3 s.h. (E)
STAFF

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students, in the junior year, by permission of the department. See page 38.

LATIN

Students who wish by study in English to make acquaintance with Roman antiquity from either a literary or an historical approach are afforded that opportunity through the courses in translated Latin Literature (111, 112), and Roman History (131, 132).

1-2. COURSE FOR BEGINNERS.—Forms, vocabulary, pronunciation, and syntax, with reading of easy Latin prose. The effort is made to promote rapid development of the ability to read Latin with satisfaction. 6 s.h. (E) SETTLE

63. CICERO'S ORATIONS.—Selected orations of Cicero are read with attention to prose style. Prerequisite: Latin 1-2, or equivalent. 3 s.h. (E)
SETTLE AND WOOLEY

91. LATIN PROSE.—Selections from prose authors or Cicero's *De Senectute* and *De Amicitia,* or selected books of Livy's history, with special emphasis on developing competence in reading Latin. 3 s.h. (E) STANLEY AND WOMBLE

92. LATIN POETRY.—Selections from the greatest Latin poets, especially Horace's *Odes.* 3 s.h. (E) STANLEY AND WOMBLE

97. SIGHT READING IN CLASSICAL LATIN.—One period of an hour per week devoted to practice in the reading of Latin on the classical period; designed to train students to read with facility. 1 s.h. (E) WILLIS

98. SIGHT READING IN MEDIAEVAL LATIN.—One period of an hour per week devoted to reading interesting mediaeval prose and poetry. Prerequisite: at least one of the following courses: Latin 63, 64, 91, 92, and 97, or an equivalent. 1 s.h. (E) WILLIS

101. TACITUS.—Interesting and historically important selections from the *Annals* or the *Histories* of Tacitus are read, with attention to the literary style and the value of the historical narrative. 3 s.h. (E) SETTLE

102. JUVENAL.—Juvenal's literary satire forms the basis of the course. 3 s.h. (E) SETTLE

103. CICERO.—Selections from one of the major philosophical works, with attention to Cicero's philosophical thought and literary style. 3 s.h. (E) WILLIS

104. LUCRETIUS.—A study of Lucretius as a philosophical thinker and as a poetic artist. 3 s.h. (E) WILLIS

105-106. LATIN PROSE COMPOSITION.—Recommended to students who are pursuing courses 63, 64, 91, 92, and 97, and may at the discretion of the instructor be required of such students. 4 s.h. (E)

111, 112. ROMAN LITERATURE IN ENGLISH TRANSLATION.—Selective readings in Latin literature in English translation with emphasis on the drama, lyric poetry, and the varied contributions of Cicero to literature in the first term, and upon the epic, the satire, and the novel in the second semester. (No language credit.) 6 s.h. (E) SETTLE

131, 132. HISTORY OF ROME.—A survey of the history of the Roman State from its beginnings to the death of Justinian; its expansion; development of its constitution and public administration; social, legal, political and economic problems of perennial life and interest; the background and setting of Christianity's rise and growth. (This course carries no language credit. No knowledge of Latin is required for admission.) 6 s.h. (E) ROGERS

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the department. See page 38. 6 s.h.

205-206. MEDIAEVAL LATIN.—Selections from representative writers in prose

and poetry. Practice in dealing with microfilms of mediaeval Latin texts. 6 s.h. (W) ULLMAN

211-212. ROMAN ORATORY.—A reading course in the history and development of Roman oratory, based for the most part on Cicero's *Brutus* and the *Dialogus* of Tacitus. 6 s.h. (E) ROGERS

DEPARTMENTAL MAJOR IN GREEK

Prerequisite: Greek 1-2.

Major Requirements: 24 semester hours, including the following courses: Greek 63-64, 105-106, 107-108, 117-118, and 131.

Related Work: Eighteen semester hours, selected usually in Latin, linguistics, philosophy, art, and English.

DEPARTMENTAL MAJOR IN LATIN

Prerequisite: Latin 1-2, 63-64, or equivalent.

Major Requirements: 24 semester hours which must include courses 91, 92, 101, 102, 103, 104, and 6 semester hours in courses at the 200-level.

Recommended Courses: Latin 105-106, Composition, and 131, 132, Roman History.

Related Work: Eighteen hours of related work, elected usually in Greek, linguistics, philosophy, art, Romance Languages, and English. Majors who contemplate graduate work are reminded of the necessity of Greek, German, and French for such study.

Graduates of Duke University may attend the American School of Classical Studies at Athens, Greece, without charge for tuition and are eligible to compete for the fellowships that are offered annually by the School. These consist of two fellowships in Greek archaeology and one in the language, literature, and history of ancient Greece, each with a stipend of $2,000. They are awarded mainly on the basis of examinations held in the beginning of February of each year. A somewhat similar connection exists with the American Academy in Rome.

COLLOQUIUM 101, 102.—See *Honors-Masters Program* on pages 37 and 94 of this *Bulletin*.

COMPARATIVE LITERATURE

The courses in Comparative Literature may be taken as electives by advanced students; certain courses serve as related work in several departments (see the entries for related work under the separate departments).

No major work is offered in Comparative Literature. Students interested in the study of the interrelationships of literature as a part of their undergraduate program, or as preparation for graduate work, should consult Mr. Salinger.

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to qualified students in the junior year, by permission of the department. See p. 36. 6 s.h. SALINGER

201, 202. ROMANTICISM.—Studies in the origin, rise and development of the Romantic Movement in the chief literatures of the Western World. The approach is comparative; the principal emphasis will be on England, France, and Germany, with some reference to other countries. Selected subjects will be covered in occasional lectures by speakers from various departments of the University. 6 s.h. SALINGER

203, 204. REALISM AND SYMBOLISM.—Comparative studies in the literatures of England, France, Germany, Russia, the Scandinavian countries, Spain and Italy, tracing the decline of romantic individualism and the reappraisal of man's significance against the social background. Selected subjects will be covered in occasional lectures by speakers from various departments of the University. 6 s.h. SALINGER

205. FOUNDATIONS OF TWENTIETH-CENTURY EUROPEAN LITERATURE.—The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Lagerkvist, Anouilh, Camus) evolving toward a mythology of man. 3 s.h. SALINGER

For a description of the following courses see the departmental listing.

READINGS IN EUROPEAN LITERATURE (English 153, 154). KRUEGER
READINGS IN SCANDINAVIAN LITERATURE (English 159) ANDERSON
MODERN EUROPEAN DRAMA (English 155) REARDON
RELIGIOUS VALUES IN CLASSICAL AND EUROPEAN LITERATURE (Religion 187). WHITE

ECONOMICS AND BUSINESS ADMINISTRATION

PROFESSOR SMITH, CHAIRMAN; PROFESSOR JOERG, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BLACK, DE VYVER, DICKENS, FERGUSON, HANNA, HOOVER, LANDON, MCGEE, SAVILLE, AND SPENGLER; ASSOCIATE PROFESSORS BLACKBURN, DAVIES, GERHARD, GOODWIN, KELLER, KREPS, AND YOHE; ASSISTANT PROFESSORS DE ALESSI, ETTIN, KEANE, NAYLOR, PETHIA, AND WALLACE; VISITING PROFESSORS INGRAM, C. KREPS; VISITING ASSOCIATE PROFESSOR ROBERTS; VISITING ASSISTANT PROFESSORS (PART-TIME) GALIFIANAKIS AND HAHN; MESSRS. BRUCKER, RUTMAN, SAYLOR, AND WARREN

The courses offered by the Department are listed under three divisions, Economics, Accounting, and Business Administration.

In general, the Economics courses aim to develop in the student such critical and analytical skills as underlie the ability to understand economic problems and institutions, both in their contemporary and in their historical setting. While no particular vocational or professional goal is emphasized, these courses furnish the academic background necessary for many positions in industry, for work in the economic branches of government service, and for graduate study in economics and the social sciences.

Courses in Accounting and Business Administration, although more concerned with general principles than with specific applications, stress in greater measure than courses in Economics the knowledge and techniques useful to students definitely preparing for business careers. The student who majors in Accounting may elect courses in accountancy, business law, and related work, sufficient to qualify for admission to C.P.A. examinations.

Economics 1 or 51 and 2 or 52 are recommended to all students planning to elect further courses in Economics and Business Administration.

ECONOMICS

1. INTRODUCTION TO ECONOMIC PROBLEMS AND POLICIES.—The present-day American economy and the challenge from centrally planned economies; policies to deal with problems of depression, inflation, growth, and automation. 3 s.h. (E & W) (Open only to Freshmen.) STAFF

2. THE EVOLUTION OF ECONOMIC IDEAS.—A study of man's economic activities and his ideas about them, from the ancient world to the present day. Emphasis is given to the historical roots of important contemporary economic ideologies. 3 s.h. (E & W) (Open only to Freshmen.) STAFF

51. PRINCIPLES OF ECONOMICS.—Examination of the main features of the American economy, measurement of national income, and analysis of forces determining national output and income; fluctuation and growth of output, monetary and fiscal policies for stability and growth. 3 s.h. (E & W) STAFF

52. PRINCIPLES OF ECONOMICS.—Examination of forces determining prices and production of goods, distribution of income; problems of agriculture, labor, international trade, economic development, and government in relation to business. 3 s.h. (E & W) STAFF

103. TRANSPORTATION.—Essential features, problems, and competitive positions of rail, highway, air, and inland-water transportation, with most emphasis on rail transportation. Special attention is given to the economic significance of transportation, and to cost factors, rates and their economic effects and regulations. 3 s.h. (W) LANDON

132. THE ECONOMIC HISTORY OF THE UNITED STATES.—Development of economic institutions as the United States passed from a wilderness area to an industrial society. Special attention is given to measures of economic change and their application to models of economic growth and fluctuation. 3 s.h. (w) Saville

149. THE THEORY OF THE FIRM.—Cost and supply considerations in price theory, the demand for factors of production. The allocation of resources is examined in the context of competitive and monopolistic market structures. 3 s.h. (w) de Alessi

150. ECONOMIC THOUGHT SINCE ADAM SMITH.—A course of readings in leading economic writers of the nineteenth and twentieth centuries. 3 s.h. (w) Goodwin

152. GLOBAL GEOGRAPHY.—The subject matter involves resources patterns and world affairs, geonomic problems, geocultural problems, and geographic factors affecting geopolitical questions. 3 s.h. (e) Landon

153. MONEY AND BANKING.—The lender's side of financial markets. The activities of commercial banks and other financial institutions in supplying loanable funds and the effects of these activities on the money supply and its rate of use, the impact of central bank and Treasury operations on financial markets, and the evolution of the present monetary system and its institutions. 3 s.h. (w) Yohe, Ettin

154. AGGREGATIVE ECONOMICS.—Concepts and measurement of national income and expenditures, employment, and price levels; the theoretical determination of these aggregates; and applications of macro-economic theory to business cycles and economic growth. 3 s.h. (w) Blackburn, Yohe

155. LABOR PROBLEMS.—An examination of present-day labor problems followed by an intensive study of methods used by employers and workers in meeting those problems. 3 s.h. (w) de Vyver; Mrs. Kreps

160. THE POLITICAL ECONOMY OF EUROPE: RECENT DEVELOPMENTS.—A study of changing economic relations between European countries and of the changing position of Europe in the world economy after World War II. Selected topics of an interdisciplinary nature will be discussed by visiting lecturers. (w) Gerhard

161. EUROPEAN ECONOMIC PROBLEMS.—An application of the theory of international economics to the problems of international economic integration with emphasis on the European Common Market. 3 s.h. (w) Gerhard

169. ECONOMICS OF CONSUMPTION.—Economic problems of the family. Factors determining choice; commercial and legal standards for consumer's goods; consumer credit and co-operation; income and standards of living. 3 s.h. (w) Mrs. Kreps

189. BUSINESS AND GOVERNMENT.—A survey of the public policies which most directly affect the operation of competition in the business world. The course considers the leading philosophies of public control and economic development, the validity of their presuppositions, and their influence on legislation, court decisions and administrative law. 3 s.h. (w) McGee

201. SENIOR SEMINAR IN ECONOMICS.—Problems in theory and applied economics. Readings, reports, and discussion of selected topics. For majors in Economics, with consent of the Department. 3 s.h. (w) Staff

204. ADVANCED MONEY AND BANKING.—Monetary theory and its statistical and institutional implementation. Particular attention is given to the development of aggregative theories of prices, interest rates and production; the functioning of monetary policy within various theoretical frameworks; and appraisal of the recent use and the limitations of Federal Reserve policy. 3 s.h. (w) Yohe

218. BUSINESS CYCLES.—The characteristics and measurement of cyclical fluctuations in output, employment, and prices; an historical survey of business cycle theories; modern macroeconomic theory and public policy as they relate to business cycles and associated problems of economic growth; techniques of forecasting cycles. 3 s.h. (w) Yohe

219. ECONOMIC PROBLEMS OF UNDER-DEVELOPED AREAS.—Consideration and analysis of the economic and related problems of under-developed countries. Some attention will be given to national and international programs designed to accelerate the solution of these problems. 3 s.h. (w) SPENGLER

231. ECONOMIC HISTORY OF EUROPE.—The economic development of Europe from medieval times to the present, treating such topics as the guilds, mercantilism, money, banking, crises, the Industrial Revolution, the interrelationships of government and business, and the economic consequences of war. 3 s.h. (w) SMITH

233. STATE AND LOCAL FINANCE.—A study of expenditures, taxation, and financial administration in state and local governments with emphasis on current problems. Special attention will be given to research methods and materials and to the financial relations between state and local governments. Prerequisite: Economics 287 or consent of instructor. 3 s.h. (w) DAVIES

237, 238. STATISTICAL METHODS.—A study of statistical methods appropriate for dealing with problems in business and social science. In addition to developing more thoroughly the subject considered in *Business Statistics,* the following methods will be considered: simple, multiple, partial, and curvilinear correlation; curve fitting; probability; sampling distributions; and statistical inference. Prerequisite: Economics 138 or consent of the instructor. *Either semester* may be taken for credit. 6 s.h. (w) HANNA AND WALLACE

243. MATHEMATICAL ECONOMICS.—A systematic survey of mathematical economic theory. The principal topics are vector spaces and matrices, macrostatics, especially input-output systems, and microstatics, especially models of the firm employing game theory and activity analysis. 3 s.h. (w) FERGUSON

244. INTRODUCTION TO ECONOMETRICS.—Economic theory, mathematics, statistical inference, and electronic computers applied to analysis of economic phenomena. Objective is to give empirical content to economic theory. Matrix algebra used to develop topics in inference, linear regression, and systems of simultaneous equations. Use is made of the electronic computer. 3 s.h. (w) NAYLOR

257. DYNAMICS OF THE LABOR MOVEMENT.—A study of the forces which have shaped the growth of the labor movement. Special emphasis on the origin of modern trade unionism, relating its growth with western philosophic developments, and with the changing economic and social structure of society in Europe and America. 3 s.h. (w) GOODWIN

262. TRADE UNIONISM AND COLLECTIVE BARGAINING.—An intensive survey of the trade union as an economic institution is followed by a study of the principles and problems of union-management relationship as found in collective bargaining. 3 s.h. (w) DE VYVER

265. INTERNATIONAL TRADE AND FINANCE.—A study of fundamental principles of international economic relations. Subjects covered include the economic basis for international specialization and trade, and the economic gains from trade, the balance of international payments, problems of international finance, of international investments, and international monetary problems. 3 s.h. (w) GERHARD

268. COMPETITION AND MONOPOLY.—A detailed study of the varieties of imperfectly competitive markets, the economic and legal issues which they raise, and the policy solutions which have been attempted in the United States. 3 s.h. (w) MCGEE

286. LATIN AMERICAN ECONOMICS.—A survey of the problems of economic development in twenty countries. 3 s.h. (w) SMITH

287. PUBLIC FINANCE.—An analysis of the impact of governmental expenditures, revenues, and debt on the allocation of resources, the redistribution of income, and the stabilization of income. 3 s.h. (w) DAVIES

293. ECONOMIC SYSTEMS.—A study of alternative economic systems. An historical and analytical study of the basic elements of capitalism and of collectivist types of economic systems. Particular attention is given to an analysis of the

economic system of Soviet Russia. Prerequisite: permission of the department. 3 s.h. (w) HOOVER

294. ECONOMIC FUNCTIONS OF THE STATE.—A continuation of Economics 293. A consideration of the economic functions of society and of the contrasting roles of the state in the various economic systems in carrying on these functions. The Nazi system, the quasisocialized economics of Europe, as well as the modifications of old-style capitalism in the United States are analyzed. Prerequisite: Economics 293. 3 s.h. (w) HOOVER

ACCOUNTING

57. PRINCIPLES OF ACCOUNTING I.—Provides a basic knowledge of accounting and a consideration of financial statements. Attention is focused on the nature and purpose of accounting, the measurement and classification of economic data, and accounting reports as a tool of management and the investor. 3 s.h. STAFF

58. PRINCIPLES OF ACCOUNTING II.—The problems of accounting for the control of monetary assets and costs, the problems of capital stocks and the elementary problems of decision making. The relationship of the firm and national income accounts is examined. Prerequisite: Economics 57. 3 s.h. STAFF

147. ACCOUNTING FOR CONTROL.—This course traces the ways and means of executive control through statistics and industrial accounting. Emphasis is placed upon controlling business enterprises through cost accounting, financial reports, and other techniques. This course is not open to accounting majors. Prerequisite: Economics 57-58. 3 s.h. (w) BLACK AND JOERG

171. ACCOUNTING THEORY.—Basic concepts, principles, and postulates are examined and related to the objective of income determination and asset valuation. Financial statements as a source of economic data and investor information are the focal points of the course. Prerequisite: Economics 58. 3 s.h. (w) KELLER

172. CORPORATE ACCOUNTS.—Deals with the complex problem of capital structure and debt. Considers in detail the effect of fluctuation in the purchasing power of the dollar on business affairs. Examines critically the many faceted problem of measuring and appraising business performance. Studies the many aspects of business combinations and foreign operations. Prerequisite: Economics 171. 3 s.h. (w) KELLER

178. ACCOUNTING SYSTEMS.—A presentation of the design and use of basic accounting procedures as applied to specialized business needs. Field trips to selected business units will be arranged. Prerequisite: Economics 171, 172 and the permission of the department. 3 s.h. (w) DICKENS

180. GOVERNMENTAL ACCOUNTING.—Accounting principles and methods used in the control and administration of governmental units. Emphasis is placed upon state, county and municipal governments. Prerequisite: Completion of or registration for Economics 171, 172. 3 s.h. (w)

273, 274. AUDITING, THEORY AND PRACTICE.—A study of basic auditing objectives, standards, ethics, terminology, procedures and reports. Accounting principles and statement presentation are studied from the viewpoint of the auditor. The place and responsibility of both the internal auditor and the public auditor are studied. Prerequisite: Economics 171, 172 and permission of the department. 6 s.h. (w) DICKENS

275, 276. ADVANCED INDUSTRIAL ACCOUNTING AND MANAGEMENT.—A comprehensive examination of the rationale and techniques of control methods used in industry. Emphasis is laid on a critical evaluation of the practices followed by job-order, process, and standard costing as well as the economics of overhead costs. Prerequisites: Economics 171, 172 and permission of the department. 6 s.h. (w) BLACK

277. INCOME TAX ACCOUNTING.—Presentation of the principles of Federal Income Tax laws as related to individuals, partnerships, estates, trusts and corporations. Prerequisite: Completion of or registration for Economics 171, 172. 3 s.h. (w) KEANE

278. ADVANCED PROBLEMS IN INCOME TAXATION.—A critical appraisal

of selected topics in the law of income taxation as it relates to corporations, partnerships, estates, and trusts. 3 s.h. (w) KELLER

279. BUDGETING AND CONTROL.—A consideration of methods used in period and project budgeting; the use of accounting, statistical, and mathematical methods in cost control; the use of numerical data in making decisions among alternative courses of action. 3 s.h. (w)

295, 296. ADVANCED ACCOUNTING SEMINAR-THEORY AND PRACTICE.—Thorough practice in classroom to prepare candidates for the Certified Public Accountant examination. The object is to train students to apply accounting principles and to work in classroom under substantially the same conditions as in the examination rooms. Practical accounting problems, auditing analysis and theory of accounts. Prerequisite: Economics 171, 172 and permission of the department. 6 s.h. (w) BLACK

Those who do not wish credit may take Economics 295, 296 for $25.00 per semester.

BUSINESS ADMINISTRATION

109. ECONOMIC GEOGRAPHY OF LATIN AMERICA.—This course involves comprehensive study of the resources and people of Mexico, the West Indies, and Central and South America. Special emphasis is placed upon the possibilities and limitations of increases in trade between the United States and the leading Latin-American countries. 3 s.h. (E)

114. ECONOMIC GEOGRAPHY OF AFRICA.—A continental study of the natural environmental factors of Africa and the basic economic patterns of adjustments and adaptations on regional or national bases. Prerequisite: Economics 115 or 120. 3 s.h. (E) TUTHILL

115. FUNDAMENTALS OF GEOGRAPHY.—A study of geographic influences consisting of location, maps and their interpretation, climate, topography, soils, minerals, bodies of water, plants, animals, and the works of man. This course is required of all students in the Elementary School Teaching program, and is also recommended for those intending to specialize in foreign trade or the diplomatic service. 3 s.h. (E) LANDON

120. ECONOMIC GEOGRAPHY OF THE PACIFIC.—An analysis of the physical influences, natural resources and economic activities of the Orient. 3 s.h. (E) TUTHILL

138. BUSINESS STATISTICS.—A survey of the principal statistical methods and their application to economics and business administration. The course deals with collection of statistical data, construction of statistical tables and charts, and a brief study of the fundamental statistical concepts and techniques. Offered both semesters. 3 s.h. (w) HANNA AND WALLACE

Open to juniors and to sophomores in the second semester. Not open to seniors except with permission of the Director of Undergraduate Studies.

143. CORPORATION FINANCE.—Principles and problems in the financial organization of corporations; the study of corporate securities, the management of capital, the distribution of earnings; industrial combinations; insolvency and reorganization. Prerequisite: Economics 57. Offered both semesters. 3 s.h. (w) JOERG AND ETTIN

144. INVESTMENTS.—A study of the investment policies of individuals and institutions; the securities markets; sources of investment information and data; the analysis and interpretation of financial statements. Prerequisites: Economics 143. 3 s.h. (w) JOERG AND ETTIN

146. MANAGERIAL ECONOMICS.—Economic analysis of the business firm, its goals, and the economic environment of business. Economic theory of the firm; various mathematical models of the firm; the internal decision making processes. No credit for those who have completed Economics 149. 3 s.h. (w) NAYLOR, WALLACE

181. BUSINESS LAW.—The fundamental principles of law as applied to routine business transactions. The topics presented are: contracts, agency, and negotiable instruments. 3 s.h. (w) GALIFIANAKIS

182. BUSINESS LAW.—A continuation of 181. The topics presented are: partnerships, corporations, sales, personal and real property, mortgages, suretyship, bankruptcy and trade regulation. 3 s.h. (w) GALIFIANAKIS

184. COMMERCIAL LAW FOR ACCOUNTANTS.—A review and summation of commercial law principles as they apply to accounting theory and practice. Emphasis will be placed upon the commercial law sections of the Certified Public Accountant examinations. Students are admitted to the course by permission of the instructor. *For seniors.* 3 s.h. (w) BLACK

185. BUSINESS ADMINISTRATIVE ORGANIZATION.—An analysis of human behavior in administrative organizations followed by a critical examination of alternative theories of administration and organization as relevant to the business firm. 3 s.h. (w) PETHIA

188. PERSONNEL MANAGEMENT.—A study of the fundamental principles and problems of labor management and of collective bargaining under modern industrial conditions and under existing labor legislation. 3 s.h. (w) PETHIA

190. QUANTITATIVE METHODS IN BUSINESS.—Introduction to operations research. Application of mathematics, statistics, and electronic computers to the solution of management problems. Topics include linear programming, inventory models, queuing theory, Markov processes, and computer simulation. 3 s.h. (w) NAYLOR

249. PRODUCT MARKETS.—Consumer behavior in price theory, the demand for final products. Relates the firm's demand to the type of market structure, and examines the firm's attempts to predict demand, its attempts to influence demand, and its price policies. 3 s.h. (w) LANDON

291. BUSINESS POLICY.—An integrating course where, through analysis of a series of case problems from the top management viewpoint, the student is given practice in arriving at effective courses of action to solve business problems. To complete this course satisfactorily the student will be required to draw upon the institutional knowledge and techniques acquired in the other courses in the department. Prerequisites: Business Administration requirements through the junior year. 3 s.h. (w) JOERG

DEPARTMENTAL MAJORS

The Department of Economics and Business Administration offers specialization in three major areas—Accounting, Business Administration and Economics. Each program requires that the student take the same required prerequisite courses in the Freshman and Sophomore years.

A. Prerequisites required of all majors in the Department:

1. Mathematics 17 or 21 (Preferably Mathematics 21)
2. Economics 1 or 51 and 2 or 52.
3. Economics 57

B. Number of hours needed in each major area: 21 hours in addition to Economics 1 or 51 and 2 or 52 and Economics 57.

1. *Economics*
   Required courses: Economics 138, 149, 154
   Elective courses: Any 12 hours selected from the Economics section (not Accounting or Business Administration) of the Departmental course offerings. Economics 143 and 190 from the Business Administration section may also be offered to meet the Elective requirement.
2. *Business Administration*
   Required courses: Economics 58 (should be taken in Sophomore year)
   Economics 138, 143, 146, 291
   Elective courses: 6 hours selected from the following courses:
   Economics 144, 185, 190, 249
3. *Accounting*
   Required courses: Economics 58 (should be taken in the Sophomore Year).
   Economics 138, 143, 171, 172, 273, 275

C. Related work:

1. Number of hours required: 18 hours.
2. Departments in which related work is usually taken:
   Mathematics, the other social sciences, history, and psychology. In special cases courses taken in other departments may be counted as related work with the approval of the Department and the dean.

The Department offers work leading to graduation with distinction. See the section on Honors.

EDUCATION

PROFESSOR CARTWRIGHT, CHAIRMAN; PROFESSOR STUMPF, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BOLMEIER, GITHENS, HOPKINS, AND HURLBURT; ADJUNCT PROFESSOR HOWE; ASSOCIATE PROFESSORS COLVER, GEHMAN, JOHNSON, PETTY, RUDISILL, SHUMAN, SUBLETT AND WEITZ; ASSISTANT PROFESSORS BALLANTYNE AND MARTIN

Courses in the Department of Education are designed for two groups of students: (1) students who have definitely chosen teaching as their life work or others with teaching experience, and (2) students who desire to study the school as a unique social institution.

Students who expect to teach in the public schools should plan their courses in accordance with the general regulations set forth under Teaching. Students who intend to teach in elementary schools should advise with Professors Petty, Rudisill, Sublett, or Stumpf; those intending to teach in secondary schools should advise with Professors Cartwright, Githens, Hurlburt, Shuman, or Stumpf. Students should confer with these advisers prior to registration each semester.

Students who do not expect to teach but desire merely an understanding of the school as part of a liberal education are advised to elect such courses as 100, 113, 114 for their introductory work in the Department and then to elect further work in accordance with their special interests.

5. DEVELOPMENTAL READING.—A course consisting of study and practice for the improvement of the reading and study skills. Work is provided in such areas as vocabulary, speed of comprehension, critical interpretation, organization of ideas, and versatility of method in reading for different purposes. 3 s.h. (W)
MISS RUDISILL

68. MENTAL HYGIENE.—Development and application of psychological principles of adjustment to personal behavior. Study of factors in the development of personal adjustment as influenced by human relations in the home, school, and community. Not open to students who have had Psychology 115. 3 s.h. (E)
GEHMAN

100. SOCIAL FOUNDATIONS OF AMERICAN EDUCATION.—A study of the basic features, assumptions, viewpoints, and issues of education in contemporary America. This or 113 required of all who intend to practice teach and of all majors in Education. This course should be taken in the junior year. *Either semester.* 3 s.h. (E) JOHNSON, MARTIN, STUMPF, AND SUBLETT

101. ELEMENTARY EDUCATION: PRINCIPLES.—The nature, subject matter, and organization for instruction of elementary education in the primary and grammar grades. Required in the elementary-education major. 2 s.h. (E)
PETTY, SUBLETT

102. ELEMENTARY EDUCATION: PRACTICE.—Methods and problems of instruction in elementary education and their applications and solutions in the classroom. Required in the elementary-education major. Prerequisite: 2.0 average over-all and in the elementary-education major. 6 s.h. (E) PETTY, SUBLETT

105. ELEMENTARY EDUCATION: READING.—The process, methods, and materials basic to the teaching of reading in the elementary school. Required in school. Required in the elementary-education major. 2 s.h. (E) MISS RUDISILL

106. ELEMENTARY EDUCATION: LANGUAGE ARTS.—The processes, meth-

ods, and materials basic to the teaching of the language arts in the elementary school. Required in the elementary-education major. *Either semester.* 2 s.h. (E) MISS RUDISILL

107. ELEMENTARY EDUCATION: ARITHMETIC.—The processes, methods, and materials basic to the teaching of arithmetic in the elementary school. Required in the elementary-education major. 2 s.h. (E) PETTY

108. ELEMENTARY EDUCATION: SCIENCE.—The principles, methods, and materials basic to the teaching of the sciences in the elementary school. Required in the elementary-education major. 2 s.h. (E) GITHENS

113. HISTORY OF AMERICAN EDUCATION.—A study of American education from colonial times to the present. The development of schools, their organization, administration, curriculum, and methods as seen in relation to the social forces that have produced our particular type of civilization. 3 s.h. (E) JOHNSON

114. HISTORY OF EDUCATION IN EUROPEAN CULTURE.—A study of the evolution of the educational theory and practice from Greek civilization through 19th-century Europe. Emphasis will be placed upon the educational ideas of outstanding thinkers from Plato to Spencer. 3 s.h. (E) JOHNSON

118. EDUCATIONAL PSYCHOLOGY.—A study of the psychology of learning; individual and social development; and psychology of adjustment, as related to problems of instruction and the processes of education. Prerequisite: Psychology 91. 3 s.h. (E). BALLANTYNE, GEHMAN

142. CHILDREN'S LITERATURE.—Students may specialize in literature of either the primary or the grammar grades. 3 s.h. (E) MISS RUDISILL

151. PUBLIC SCHOOL MUSIC EDUCATION.—Required in the elementary-education major. See Music Education 151 for description.

152. PUBLIC SCHOOL MUSIC LITERATURE.—Required in the elementary-education major. See Music Education 152 for description.

153. VOCAL MUSIC IN THE PUBLIC SCHOOL.—See Music Education 153 for description.

154. INSTRUMENTAL MUSIC IN THE PUBLIC SCHOOL.—See Music Education 154 for description.

161. INTEGRATED ART IN THE PUBLIC SCHOOL.—Work in materials and methods applied in two-dimensional art. Required in the elementary-education major. *Either semester.* 2 s.h. (E) STARS

162. PLASTIC ART IN THE PUBLIC SCHOOL.—Work in basic three dimensional art, giving an understanding of different sculptural media with special emphasis on ceramics. The course is designed for students in elementary and secondary art education, and will provide credit toward the North Carolina Elementary and Secondary Teaching Certificates. 3 s.h. (E) STARS

201. TEACHING AND SUPERVISION OF ARITHMETIC.—Special attention is given to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. Considered also are the meaning theory, methods of teaching, problem solving, evaluation, practice and drill, and selection and graduation of arithmetical contents. This course is designed for teachers and supervisors in the elementary school. 3 s.h. (E) PETTY

203. PRINCIPLES OF SCHOOL ADMINISTRATION.—The fundamental facts and procedures of school administration, an analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. Prerequisite: six semester hours in education. 3 s.h. (E) BOLMEIER, HURLBURT, AND STUMPF

204. THE SCHOOL AS AN INSTITUTION.—Consideration is given to the place of the school in the American social order, and its adaptation to social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunities. 3 s.h. (E) BOLMEIER, MARTIN

210. INTRODUCTION TO EDUCATIONAL RESEARCH.—The general pur-

pose of this course is to give the student an overview of research, acquaint him with the nature of research processes, and develop within him an understanding of the essential characteristics of good research work. The course is designed to be liberalizing as well as technical. 3 s.h. (E) STUMPF

215. SECONDARY EDUCATION: PRINCIPLES.—Intensive study of principles, curriculum, and methods in secondary education. Accelerated course meeting six hours a week for half a semester. Prerequisite: 2.0 average over-all and in teaching field or fields. Must be accompanied by Education 216. *Either semester.* 3 s.h. (E) GITHENS, HURLBURT, SHUMAN

216. SECONDARY EDUCATION: INTERNSHIP.—Supervised internship in junior or senior high schools. Full-time observation and teaching for half a semester, accompanied by Education 215. Prerequisite: 2.0 average over-all and in the major or teaching field. *Either semester.* 6 s.h. (E) CARTWRIGHT, GITHENS, HURLBURT, SHUMAN

NOTE: Education 215, 216, 118, and one other course, depending on the student's field, constitute a semester's work during the senior year.

217. THE PSYCHOLOGICAL PRINCIPLES OF EDUCATION.—An advanced study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 3 s.h. (E) GEHMAN, WEITZ

225. THE TEACHING OF HISTORY AND THE SOCIAL STUDIES.—Evaluation of the objectives, content, materials and methods in the teaching of history and the social studies. 3 s.h. (E) CARTWRIGHT

226. TEACHING READING IN THE ELEMENTARY SCHOOL.—A study of the nature of the reading process and of principles, methods and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. Practice is provided with elementary-school children suffering reading retardation, in testing, diagnosis, and daily remedial teaching. 3 s.h. (E) MISS RUDISILL

228. IMPROVEMENT OF INSTRUCTION IN THE SOCIAL STUDIES.—An advanced treatment of curriculum, methods, and materials in the social studies. Individuals will concentrate on subjects and grade levels of their choice. 3 s.h. (E) CARTWRIGHT

232. SUPERVISION OF INSTRUCTION.—A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to community needs. 3 s.h. (E) HURLBURT

234. SECONDARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 3 s.h. (E) BOLMEIER

235. THE NATURE, FUNCTION, AND REORGANIZATION OF THE CURRICULUM.—Selected problems, and guiding students' reading. 3 s.h. (E) CARTWRIGHT, SUBLETT

236. TEACHING READING IN THE SECONDARY SCHOOLS.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. For secondary-school teachers of all subjects who wish to improve the reading and study habits of their students. 3 s.h. (E) MISS RUDISILL

237. LITERATURE FOR ADOLESCENTS.—The course offers a critical survey of literature written for, or appropriate for junior and senior high school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 3 s.h. SHUMAN

239. METHODS AND PROBLEMS OF TEACHING ENGLISH IN SECONDARY SCHOOLS.—This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar and composition.

Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles in the field. Several short compositions and a report will be required. 3 s.h. (E) BOWMAN, SHUMAN

240. EDUCATIONAL AND OCCUPATIONAL INFORMATION.—A study of the sources of occupational and educational information: methods of securing and organizing occupational information; methods of providing vocational and educational information to students through career days, college conferences, class activities, and individual counseling; methods of making job analyses and community occupational surveys. 3 s.h. (W) COLVER

241. PRINCIPLES OF GUIDANCE.—An historical survey of the philosophies of guidance; a study of the interrelationships between instruction, administration, and guidance in education. Prerequisite: 6 hours of psychology or educational psychology. 3 s.h. (W) COLVER

243. PERSONALITY DYNAMICS.—A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 3 s.h. (E) GEHMAN

246. THE TEACHING OF MATHEMATICS.—This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. 3 s.h. (E) REYNOLDS

253. SCHOOL LAW.—The primary purpose of this course is to familiarize prospective school administrators and teachers with the legal features of school organization and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 3 s.h. (E). BOLMEIER

258. EDUCATIONAL MEASUREMENTS.—A critical study of the principles and techniques involved in measurement in education with opportunity for individual research. Prerequisite: 12 semester hours in the Department, including a course in educational psychology. 3 s.h. (E) COLVER, WEITZ

266. SCIENCE IN THE ELEMENTARY SCHOOL.—Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equipment, and field studies. 3 s.h. (E) GITHENS

276. THE TEACHING OF HIGH-SCHOOL SCIENCE.—Discussion, lectures and collateral reading related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for secondary-school science. 3 s.h. (E) GITHENS

290. ADMINISTRATION OF SCHOOL PROPERTY.—Planning and management of the school plant and its equipment to meet instructional and community needs for immediate and long-range purposes. This course is intended for teachers and principals as well as for superintendents. Areas to be treated include site selection; trends in design, lighting, ventilation and heating; custodial service and maintenance; and financing. 3 s.h. (E) STUMPF

DEPARTMENTAL MAJOR

The only undergraduate major in Education at Duke University is that in elementary education.

The Department offers work leading to graduation with distinction. See the section on Honors in this *Bulletin*.

MATERIALS AND METHODS COURSES

Certain courses concerned with materials and methods in teaching the various subjects in the public school curriculum are listed in the proper subject matter department. These courses are intended to give credit on teaching certificates and are recommended by the Department of Education for such credit.

MAJORS IN ELEMENTARY EDUCATION AND SCIENCE EDUCATION

Students desiring to teach in elementary schools or in science in secondary schools should read the descriptions of these programs of study listed under the proper headings elsewhere in this *Bulletin*.

ENGINEERING

For courses in Civil, Electrical, and Mechanical Engineering, see pages 138-146.

ENGLISH

PROFESSOR STEVENSON, CHAIRMAN; ASSOCIATE PROFESSOR FERGUSON, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR L. PATTON, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS BLACKBURN, BOWMAN, BOYCE, DUFFEY, GOHDES, KNIGHT, LIEVSAY, LUMIANSKY, NYGARD, SANDERS, TURNER, AND WARD; ASSOCIATE PROFESSORS ANDERSON, BEVINGTON, BUDD, HARWELL, HENINGER, REARDON, SMITH, WETHERBY, AND WILLIAMS; ASSISTANT PROFESSORS CLOGAN, JONES, JORDAN, KRUEGER, MICHALAK, POTEAT, PRICE, RANDALL, RIDDEL, SCHWERMAN, AND VAN KLUYVE; VISITING LECTURER F. PATTON; INSTRUCTORS GERBER, HOLLAND, JENNINGS, MOORE, AND ROBINSON; MISSES COBLE, DORMAN, HILLS, AND KIRBY-SMITH; MESSRS. ANDREWS, ARPAD, BABIN, CONE, DUNN, FISHER, GRAVES, HARRIS, HENSLEY, HERNDON, HOLMES, KAUVAR, LAVIA, LENTRICCHIA, LUDINGTON, MCILWAINE, MASCITELLI, MITCHELL, NEUBAUER, PRIDGEON, RAND, ROCKS, SCHWARZ, SPIVEY, VAN, WATSON, AND WHISNANT

1-2. FRESHMAN COMPOSITION.—Training in composition through the writing of weekly expository themes. The theme subjects derive from assigned reading drawn from British and American literature of the Twentieth Century. English 1 takes up the Essay, the Short Story, and the Novel; English 2, the Play and the Poem. The student attends each week (1) a general lecture on the reading for the week; (2) a section meeting, where the instructor and a small group discuss problems of composition and literature; and (3) an individual conference in which the instructor reads and grades the weekly theme and makes special assignments according to the needs of the student. 6 s.h. (E & W) STAFF

53. ADVANCED GRAMMAR AND WRITING.—Emphasis is placed first on the student's mastering the fundamental principles of English grammar and the other essentials of correct writing. 3 s.h. (E) JORDAN

65-66. IMAGINATIVE WRITING.—A foundation course in imaginative writing, both prose and verse. Primarily for sophomores, but in special cases open to students from other classes. The consent of the instructor is required. 6 s.h. (E) MRS. PATTON AND SANDERS

93. TECHNICAL COMMUNICATION.—Emphasis will be placed on the writing of business letters, technical reports, and articles for submission to technical journals. Approximately one-third of the course will provide training in the oral presentation of various materials. Prerequisite: English 1 and 2. 3 s.h. (W) HARWELL AND STAFF

100. ENGLISH FOR FOREIGN STUDENTS.—Designed to assist the student to whom English is a second language to perfect his speaking and understanding of the language. Drills in writing, speaking, listening and the American idiom. Open to all students and their wives, and to any persons and spouses with an official connection with the University. Those who do not pay full-time student fees may register for a fee of $5.00. No credit. (W) WETHERBY

101. ADVANCED EXPOSITORY WRITING.—Designed for students interested in expository writing, this is a course in advanced composition. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (E) FERGUSON

103-104. NARRATIVE WRITING.—Class discussion of students' manuscripts, supplemented by a critical evaluation of selected short stories and a novel and by individual conferences with the instructor. Open to sophomores, juniors, and seniors. Students desiring admission to the course should present a piece of writing

to the instructor as early as possible in the spring semester. Prerequisite for English 104: English 103. 6 s.h. (E) BLACKBURN

SPEECH AND DRAMA

51. ESSENTIALS OF PUBLIC SPEAKING.—A basic course in public speaking, designed to give the student the poise and confidence necessary to think and speak freely before an audience. Particular attention is paid to the gathering and organization of speech materials and to oral presentation. Not open ordinarily to juniors and seniors. 3 s.h. (W) MICHALAK, REARDON, AND MISS SCHWERMAN

118. PERSUASIVE SPEAKING.—The psychological and sociological techniques used in gaining acceptance of ideas through speech. Study is made of the factors influencing human behavior; audience analysis and motivation; choice, arrangement, and adaptation of material. Extensive practice in persuasive speaking. Prerequisite: English 51 or 151 or consent of the instructor. 3 s.h. (W) WETHERBY

119. HISTORY OF THE THEATER.—The origin and development of drama, acting, and stagecraft from ancient Greece to the modern European and American theater. Production problems of representative plays of the various periods will be discussed. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (W) MICHALAK

121. STAGECRAFT.—An introductory course on the technical aspects of play production: scenery, lighting, properties, make-up, and costuming. Laboratory work will be coordinated with the various productions of the Duke Players. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (E) MICHALAK

122. PLAY PRODUCTION.—An introduction to the methods of producing a play; theater organization, play selection, casting, and rehearsal. Lectures and laboratory. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (E) MICHALAK

139. THE SPEAKING VOICE.—A study of the mechanisms of speech. Emphasis is placed on providing the skills necessary for the improvement of voice, pronunciation, and diction. Methods of correcting minor functional speech disorders will also be studied. 3 s.h. (W) MISS SCHWERMAN AND WETHERBY

150. ORAL INTERPRETATION OF LITERATURE.—A study of poetry and certain types of prose, with practice in the technique by which they may be communicated to an audience. 3 s.h. (W) MISS SCHWERMAN

151. ESSENTIALS OF PUBLIC SPEAKING.—A basic course in public speaking for juniors and seniors dealing with the same matters as 51. (Not open for credit to students who have taken 51.) 3 s.h. (E & W) MICHALAK, REARDON, AND MISS SCHWERMAN

152. ARGUMENTATION.—The principles of argumentation and debating. The techniques of analysis, investigation, evidence, reasoning, brief making, and refutation. Participation in class discussions and debates. Prerequisite: English 51 or 151 or consent of the instructor. 3 s.h. (W) WETHERBY

171, 172. BROADCASTING.—A study of the background of radio and television broadcasting. The first semester covers the development of broadcasting as an industry and as a literary form. The second semester studies the legal and social aspects, and the various program forms. 6 s.h. (W) WETHERBY

ENGLISH AND AMERICAN LITERATURE AND LANGUAGE

55, 56. REPRESENTATIVE BRITISH WRITERS.—The following works are studied in the first semester: Chaucer's Prologue to *The Canterbury Tales* and at least two tales, Shakespeare's *I Henry IV*, *Hamlet* or *King Lear*, and one other play, John Donne's poetry (selections), Milton's *Paradise Lost* (selections) and some of the shorter poems; in the second semester: novels by Fielding (*Joseph Andrews*), Dickens (*Great Expectations*), and Hardy (*The Mayor of Casterbridge*), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 6 s.h. (E & W) STAFF

57, 58. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works. The first semester will include Poe, Emerson or Thoreau, Hawthorne, Mel-

ville, Whitman, Dickinson, and Twain; the second will include James, Frost or Robinson, Crane or Dreiser, O'Neill, Faulkner, Hemingway, and others. 6 s.h. (E & W) STAFF

111, 112. EIGHTEENTH-CENTURY LITERATURE.—The writers emphasized in the first semester are Pope, Swift, Defoe, Addison, Steele, and Fielding; in the second semester, Johnson, Gray, Boswell, Goldsmith, Sheridan, the later novelists, and Blake. 6 s.h. (E) BOYCE, FERGUSON, AND WARD

117. MILTON.—Milton's poetry and prose, together with their relation to the period and to other great works of literature. 3 s.h. (E) LIEVSAY

123, 124. SHAKESPEARE.—In the first semester twelve plays, before 1600; in the second semester about ten plays, after 1600. 6 s.h. (E & W) BOWMAN, HENINGER, RANDALL, WARD, AND WILLIAMS

125, 126. ENGLISH LITERATURE, 1789-1832.—The course begins with selections from the poetry of the forerunners of Romanticism. The chief emphasis in the first semester is on the work of the older Romantics: Wordsworth, Coleridge, Lamb, and Hazlitt. In the second semester the chief emphasis is on the work of the younger Romantics: Byron, Shelley, Keats, and DeQuincey. 6 s.h. (W) PATTON

127. THE ENGLISH NOVEL FROM THE BEGINNINGS TO 1800.—Some of the writers studied are Nashe, Deloney, Lyly, Sidney, Bunyan, Behn, Defoe, Richardson, Fielding, Smollett, and Sterne. (Not open for credit to students who have taken 157.) 3 s.h. (E) RANDALL

128. THE ENGLISH NOVEL IN THE NINETEENTH CENTURY.—Some of the writers studied are Scott, Austen, Dickens, Thackeray, Trollope, the Brontës, George Eliot, Meredith, Butler, and Hardy. (Not open for credit to students who have taken 157.) 3 s.h. (E) FERGUSON

129. THE ENGLISH NOVEL IN THE TWENTIETH CENTURY.—Some of the writers studied are Conrad, Lawrence, Forster, Joyce, Woolf, Huxley, Cary, Amis, and Golding. (Not open for credit to students who have taken 158.) 3 s.h. (E) SMITH

131, 132. ENGLISH LITERATURE, 1832-1900.—A study of the chief writers of poetry and prose from Carlyle to Yeats. The major writers studied in the first semester are Carlyle, Tennyson, Browning, Macaulay, Mill, and Newman; in the second semester, Arnold, Ruskin, the Rossettis, Morris, Swinburne, Pater, and Yeats. Collateral reading from novels of the period. 6 s.h. (E) HARWELL, SANDERS, AND STEVENSON

133, 134. TWENTIETH-CENTURY POETRY.—A study of twentieth-century poetry and criticism of poetry in England and America. Problems in critical analysis and interpretation. First semester: the emphasis is on sources in nineteenth-century Symbolism and on the poetry of Hopkins, Yeats, Eliot, Pound, and Stevens. Second semester: the emphasis is on the poets and the poetic theories of the last thirty years. 6 s.h. (E) MRS. BEVINGTON

137, 138. AMERICAN LITERATURE.—A survey from colonial times to the present. Selections and complete novels by Hawthorne and Melville in the first semester; Twain, Henry James, Howells, and others in the second. (Not open for credit to students who have taken a matching semester of 57, 58.) 6 s.h. (E & W) ANDERSON, BUDD, DUFFEY, AND RIDDEL

141. CHAUCER.—*The Canterbury Tales* and the minor poems, with attention to their literary and social background. 3 s.h. (W) LUMIANSKY AND VAN KLUYVE

142. ENGLISH LITERATURE OF THE MIDDLE AGES.—A study of the principal forms and examples of English prose, poetry, and drama of the Anglo-Saxon and Middle English periods (excluding Chaucer), read in translation. 3 s.h.

143, 144. ENGLISH LITERATURE: ELIZABETHAN AND SEVENTEENTH CENTURY.—A study of the poetry, prose, and drama of the period. First semester: the emphasis in poetry is on Wyatt, Sidney, Spenser, Raleigh, Shakespeare; in prose, on Sidney and Florio's Montaigne; in drama, on Marlowe. Second semester: the chief emphasis is on the metaphysical poets—Donne through Vaughan. Prose: Bacon, Burton, Donne, Browne. Drama: Jonson, Webster, Ford. 6 s.h. (E) BLACKBURN

147. THE LITERARY EXPRESSION OF SCIENTIFIC THOUGHT.—Readings which delineate man's changing concept of nature, with emphasis on both the scientific thought and the literary merit of each text. Representative works of Hesiod, Plato, Aristotle, Lucretius, Descartes, Thomas Browne, Bertrand Russell, and others. Primarily for engineering students and majors in science. 3 s.h. (W) HENINGER

148. SATIRE.—An exploration of the nature and art of literary satire, based on examples, mostly English and American, of various forms and kinds; character-sketch, dialogue of the dead, fable, verse-narrative, eulogy, drama, novel, etc. Prerequisite: English 55, 56. 3 s.h. (E) BOYCE

150. ORAL INTERPRETATION OF LITERATURE.—See under "Speech and Drama."

153, 154. READINGS IN EUROPEAN LITERATURE.—Significant works are read in translation and related to similar works in English literature. The first semester includes selected writings of Homer, the Greek dramatists, Plato, Virgil, and Ovid. The second semester comprises works by Dante, More, Cervantes, Molière, Voltaire, Goethe, Dostoevski, Ibsen, and Kafka. 6 s.h. (W) HENINGER, KRUEGER, AND RANDALL

155. MODERN EUROPEAN DRAMA.—Continental and Irish plays from Ibsen to Brecht are read in relation to the modern drama of ideas and to the free theater movement. 3 s.h. (E) REARDON

156. MODERN ENGLISH AND AMERICAN DRAMA.—Plays from Pinero to Arthur Miller are read and discussed in relation to European origins and to the contemporary scene. 3 s.h. (E) REARDON

159. READINGS IN SCANDINAVIAN LITERATURE.—A study of selections in translation from Ibsen, Strindberg, Lagerkvist, and others; their place in the literary tradition of Scandinavia and their relationships with English and American literature. 3 s.h. (W) ANDERSON

161. DEVELOPMENT OF THE ENGLISH LANGUAGE.—An elementary historical study of the English language: patterns of change and growth, with some attention to methods of philological inquiry and the relations of philology to literary studies. 3 s.h. (E)

162. MODERN ENGLISH GRAMMAR.—A descriptive study of written and spoken American English of the present time, with attention to standards of usage and pronunciation and the relations of grammar to composition. 3 s.h. (E) CLOGAN

165, 166. AMERICAN FICTION.—A survey of the novel and the short story. The first semester covers the nineteenth century, from Washington Irving to Stephen Crane; the second covers the twentieth century through ten representative books. 6 s.h. (W) BUDD

167, 168. THE EUROPEAN EPIC TRADITION.—The development of the Epic tradition seen through detailed analysis of the major texts and major themes: Homer, Vergil, *Beowulf*, Dante, Cervantes, Milton, Tolstoy, Joyce. Prerequisite for 168: 167. 6 s.h. (W) (Not offered in 1965-66.) KNIGHT

181. CONFERENCE ON DRAMA.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

182. CONFERENCE ON POETRY.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

183. CONFERENCE ON FICTION.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

184. CONFERENCE ON PROSE NON-FICTION OR A SPECIAL TOPIC.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the Department. See p. 38. 6 s.h.

197-198. SENIOR SEMINAR IN ENGLISH.—A course designed to offer guidance in the analysis and interpretation of English and American literature to

students of superior ability. Comparative studies will be encouraged, and considerable reading will be required in critical and aesthetic theory. Emphasis will be placed upon the final essay. Admission by invitation of the Department. 6 s.h. (E & W) BLACKBURN AND PATTON

FOR SENIORS AND GRADUATES

203. CHAUCER.—The minor poems, *Troilus,* and *The Canterbury Tales.* 3 s.h. (W) LUMIANSKY AND NYGARD

207. OLD ENGLISH GRAMMAR AND READINGS.—3 s.h. (W) LUMIANSKY AND NYGARD

208. HISTORY OF THE ENGLISH LANGUAGE.—A survey of the language from Old to Present English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 3 s.h. (W) LUMIANSKY AND NYGARD

209. PRESENT-DAY ENGLISH.—A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; semantic change; the relation of the written to the spoken language; usage. 3 s.h. (W) NYGARD

213. INTRODUCTION TO FOLKLORE.—A survey of the materials of popular tradition, the folksong, the folktale, the proverb, the riddle, and other forms; the methods of folklore investigation; and the relation of these popular genres to literary tradition. 3 s.h. (W) NYGARD

215, 216. ELIZABETHAN DRAMA.—Study of one or two major dramatists (Jonson or Beaumont and Fletcher) and extensive reading in other writers (Heywood, Ford, Massinger, Marlowe, Middleton) with emphasis on the nature and qualities of their work in relation to its historical background. 6 s.h. (W) LIEVSAY

217. MILTON.—Milton's poetry and prose, with emphasis on the major poems. 3 s.h. (W) LIEVSAY

218. SPENSER.—The reading of Spenser's works, with chief attention to *The Faerie Queene.* 3 s.h. (W) HENINGER

219, 220. THE EIGHTEENTH CENTURY.—Swift, Pope, Defoe, Addison, Steele, and others are studied in the first semester; in the second, Gray, Johnson, Boswell, Collins, Goldsmith, the novelists and other writers. 6 s.h. (W) BOYCE AND FERGUSON

221, 222. ENGLISH LITERATURE OF THE EARLY NINETEENTH CENTURY.—The Romantic poets and prose writers from Scott to the early Carlyle, with special attention to Wordsworth, Coleridge, and Keats. 6 s.h. (W) SANDERS AND STEVENSON

223, 224. ENGLISH LITERATURE OF THE LATER NINETEENTH CENTURY.—The first semester is devoted chiefly to Carlyle, Dickens, Thackeray, Tennyson, and Browning; the second semester to Arnold, Ruskin, Pater, George Eliot, Meredith, the Pre-Raphaelites, and Swinburne. 6 s.h. (W) SANDERS AND STEVENSON

227. LITERARY CRITICISM.—Readings from the major critics, Plato to the present, with emphasis on formative ideas and historical continuity. 3 s.h. (W) LIEVSAY

229, 230. AMERICAN LITERATURE, 1800-1865.—The writers emphasized in the first semester are Emerson, Thoreau, and Hawthorne; in the second semester, Poe and Melville. 6 s.h. (W) BUDD AND TURNER

233, 234. AMERICAN LITERATURE, 1865-1920.—Selected works of representative authors of the period. The first semester's assignments will include Whitman, Lanier, Mark Twain, James, Howells, Emily Dickinson, Henry Adams, and the Local Colorists; the second semester's Crane, Norris, Moody, London, Dreiser, Edith Wharton, Willa Cather, O'Neill, Robinson, and Frost. The lectures will deal primarily with literary trends as shaped by the social background. 6 s.h. (W) GOHDES

235, 236. AMERICAN LITERATURE SINCE 1920.—First semester, selected fiction from Sherwood Anderson to the present and the Imagist movement in poetry. Second semester, later poetry and consideration of recent drama. 6 s.h. (W) DUFFEY

237. ENGLISH DRAMA, 1642-1800.—The heroic play and the comedy of man-

ners of the Restoration; the important plays, serious and comic, of the eighteenth century. 3 s.h. (w) WARD

239. SHAKESPEARE.—The plays and poems. 3 s.h. (w) WILLIAMS

244. LITERARY BIOGRAPHY.—Selected works from Plutarch to Strachey with discussion of the historical development of biography, the various methods it has used, and the various theories which have been held about it. 3 s.h. (w) SANDERS

251, 252. ENGLISH LITERATURE IN THE SEVENTEENTH CENTURY.—Major works in prose, poetry, and drama from 1600 to the death of Dryden. 6 s.h. (w) WARD

261, 262. ENGLISH LITERATURE OF THE TWENTIETH CENTURY.—Representative work of leading writers from 1900 to 1950, in fiction, drama, and poetry. The first semester will include Shaw, Conrad, Yeats, Wells, Bennett, Galsworthy, Ford, Synge, Forster, and Lawrence; the second semester, Joyce, Woolf, Edith Sitwell, Eliot, Huxley, Graves, Bowen, Auden, and Dylan Thomas. Critical analysis of selected texts, with discussion of techniques and ideas. 6 s.h. (w) SMITH

264. MAJOR DEVELOPMENTS IN CONTEMPORARY AMERICAN POETRY.—The principal contributions to modern poetry made by American poets, including imagism and the new poetry; Eliot, Stevens, Hart Crane, the "Fugitives," and a selection from the poets of the present generation. 3 s.h. (w)

266. RECENT CRITICAL THOUGHT.—Questions of the nature and value of literature as reflected in recent criticism, theoretical and practical. 3 s.h. DUFFEY

269, 270. SOUTHERN LITERATURE.—The principal authors and the chief literary developments from the beginnings to the present. Emphasis in the first semester is on Byrd, Kennedy, Simms, Poe, Timrod, and the humorists; in the second on Lanier, Harris, Cable, Mark Twain, Ellen Glasgow, and Faulkner. Attention is given to the historical and cultural background and to literary relations extending outside the region. 6 s.h. (w) TURNER

277. ENGLISH PROSE OF THE SIXTEENTH CENTURY.—Readings in the major forms and authors. 3 s.h. (w) LIEVSAY

278. ENGLISH NON-DRAMATIC POETRY OF THE SIXTEENTH CENTURY.—Extensive select readings from representative types and authors, excluding Spenser. 3 s.h. (w) HENINGER AND LIEVSAY

DEPARTMENTAL MAJOR

Prerequisite: English 55-56.

Major Requirements: Twenty-four semester hours above the sophomore level in writing, speech, drama, literature, and language; at least eighteen hours must be in English and American literature meeting the following requirements of distribution:

1. Six hours at the junior-senior level (generally to be taken in the junior year) in one of five designated period courses (143-144, 111-112, 125-126, 131-132, 137-138).
2. Three hours in one of the major authors: Chaucer, Shakespeare, or Milton (141, 203, 123, 124, 239, 117, 217).
3. Six hours (to be taken in the senior year) in senior-graduate courses, numbered at the 200 level. These courses are to be chosen so that surveys of particular periods do not heavily duplicate in subject matter the courses taken in (1) above. Conference courses numbered 181 to 184 may be substituted for part or all of this requirement.
4. The remaining hours must meet the following distribution requirements:
   (a) Three hours of English literature before 1800, unless the requirement is met in (1) or (3) above.
   (b) Three hours of English literature after 1800, unless the requirement is met in (1) or (3) above.
   (c) Three hours of American literature, unless the requirement is met in (1) or (3) above.

Related Work: Eighteen semester hours, which may include appropriate courses in history, aesthetics, art, music, foreign languages and literature, literature in

translation, philosophy, religion, linguistics, and the teaching of English. Related work must be taken in at least two departments.

The Department offers work leading to graduation with distinction. See the section on Honors in this *Bulletin.*

FORESTRY

Students without a Bachelor's degree who are preparing for work in forestry as a profession should take the courses outlined under the Academic-Forestry Combination in the section on Requirements for Degrees. However, with the consent of the instructor in charge, certain forestry courses may be elected by students in other curricular provided they have had adequate preparation (see *Bulletin of the School of Forestry*).

Members of the sophomore, junior, and senior classes, whether or not registered in the Academic-Forestry Combination, may elect the following course:

52. PRINCIPLES OF FORESTRY.—Introduction to forestry in the United States; growth of trees and forests; social and economic problems in developing America's primary renewable natural resource; contribution of forests to the national economy. 2 s.h. (W) MR. WHITE

FRENCH

For courses offered in French, see *Romance Languages,* p. 125

GEOLOGY

PROFESSOR BERRY, CHAIRMAN; ASSOCIATE PROFESSOR HERON, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSORS FURBISH AND PILKEY; AND ASSISTANTS

All students who wish to take a B.S. degree in Geology must take an approved summer field course. This normally is taken during the summer of the junior year.

51. GENERAL GEOLOGY.—This course is designed to give a general view of the surface features of the earth, their origin, structure and materials. Illustrative materials are studied in the laboratory. Excursions are made to neighboring points where the principles of the science are studied in the field. Three one-hour lectures or recitations and one three-hour laboratory. 4 s.h. (E) HERON AND STAFF

52. GENERAL GEOLOGY.—This course is designed to give some knowledge of the chief events of the earth's history. Excursions will be made to suitable neighboring localities. Three one-hour lectures or recitations and one three-hour laboratory. Prequisite: Geology 51. 4 s.h. (E) HERON AND STAFF

57. GEOMORPHOLOGY.—A detailed study of the processes at work on the land surface and the topographic forms produced by them under different climatic conditions. This course includes practice in the interpretation of topographic maps. Three one-hour lectures or recitations and one three-hour laboratory. 4 s.h. (E) BERRY

103. FUNDAMENTALS OF MINERALOGY.—Principles of crystallography, crystal chemistry, crystal physics and mineral identification. Excursions will be made to neighboring mineral localities. Three one-hour lectures or recitations and one three-hour laboratory. Prerequisite: Chemistry 1, 2 or 2 only (may be taken concurrently). 4 s.h. (E) FURBISH

106. IGNEOUS AND METAMORPHIC ROCKS.—Silicate mineralogy, theory of origin and classification of igneous and metamorphic rocks and rock identification. Two one-hour lectures or recitations and one three-hour laboratory. Prerequisite: Geology 103. 3 s.h. (E) FURBISH

108. SEDIMENTARY ROCKS.—Authigenic and detrital minerals, theory of origin and classification of sedimentary rocks and rock identification. One one-hour lecture or recitation and one three-hour laboratory. Prerequisite: Geology 51. 2 s.h. (E) HERON

143. PRINCIPLES OF STRATIGRAPHY.—Theory of correlation, sedimentation and stratigraphic units. Three one-hour lectures or recitation. Prerequisite: Geology 52. 3 s.h. (E) STAFF

151. ECONOMIC GEOLOGY.—Study of world distribution, geologic occurrence and uses of important mineral deposits. Three one-hour lectures or recitations and one three-hour laboratory. Prerequisite: Geology 103. 4 s.h. (E) BERRY

152. INTRODUCTORY PALEONTOLOGY.—Systematic study of invertebrate paleontology, dealing mainly with generic characters of the fossil invertebrates and their use in identifying and correlating geologic formations. Three one-hour lectures or recitations and one three-hour laboratory. Prerequisites: Geology 51, 52. 4 s.h. (E) BERRY

164. INTRODUCTION TO GEOLOGIC FIELD METHODS.—Principles and techniques used in geologic mapping and field studies including applicable methods of surveying and the use of aerial photographs. Field excursions will be made when possible. Two hours of lectures and three hours of laboratory each week. Prerequisites: Geology 51 and 52. 3 s.h. (E) FURBISH

166. STRUCTURE.—Structural features of the earth's crust. Three one-hour lectures or recitations. Prerequisites: Geology 106, 143. 3 s.h. (E) STAFF

175, 176. MAJORS SEMINAR.—Review of current literature in selected fields of geology. Required of all majors; 175 in the spring of the Junior year; 176 in the spring of the Senior year. One hour per week. 2 s.h. (E) STAFF

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the Director of Undergraduate Studies. (See page 38.) 6 s.h.

FOR SENIORS AND GRADUATES

203. ADVANCED STRATIGRAPHY.—A survey of the Phanerozoic deposits of the world with special emphasis on type areas. 3 s.h. (E) STAFF

206. GEOLOGICAL OCEANOGRAPHY.—A survey of geological aspects of the oceans including sediment types, processes of sedimentation, geologic structures of the ocean basins, and bottom physiography. 3 s.h. (E) PILKEY

207. SEDIMENTARY PETROGRAPHY.—Systematic description and classification of sedimentary rocks. 3 s.h. HERON

222. SEDIMENTARY MINERALS.—Major detrital and authigenic minerals with emphasis on the clay minerals. 3 s.h. (E) HERON

234. MARINE GEOLOGY.—Ocean-floor topography, sediment transport and deposition. 3 s.h. (E) PILKEY

DEPARTMENTAL MAJOR

Prerequisites: Chemistry 1, 2, Geology 51, and 52.

Major Requirements: A.B. degree, a minimum of 24 hours of geology above the elementary courses (51, 52). B.S. degree, a minimum of 24 hours of geology above the elementary courses (51, 52) plus a summer field course.

Related Work: 1. Number of hours needed for A.B., 12 s.h.; for B.S., 18 s.h. 2. Required courses, Mathematics 21, 22. 3. Departments in which related work is usually taken, chemistry, mathematics, physics, zoology, and engineering.

GERMANIC LANGUAGES AND LITERATURE

PROFESSOR SALINGER, CHAIRMAN; VISITING PROFESSOR JACKSON; ASSOCIATE PROFESSOR SEYMOUR, DIRECTOR OF UNDERGRADUATE STUDIES AND SUPERVISOR OF FRESHMAN INSTRUCTION; ASSOCIATE PROFESSORS MAXWELL, PHELPS, AND WILLSON; ASSISTANT PROFESSOR DEINERT; INSTRUCTORS ALT, ARNDT, BESSENT, AND SCHLIEWIENSKY

1-2. ELEMENTARY GERMAN.—Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. 8 s.h. (E & W) SEYMOUR AND STAFF

63-64. INTERMEDIATE GERMAN.—Prerequisite: German 1-2 or equivalent. 6 s.h. (E & W) PHELPS AND STAFF

German 63-64 is prerequisite for 91, 92 and all 100 group courses.

91, 92. INTRODUCTION TO GERMAN LITERATURE.—A third-year course, completing the language requirement. Reading from representative German authors. 4 s.h. ALT AND BESSENT

107, 108. SCIENTIFIC GERMAN.—The German language as used in the various contemporary sciences. 4 s.h.

109, 110. GERMAN PROSE FICTION.—Origin and development of the German novel and short story with special emphasis on the nineteenth century. 4 s.h. PHELPS

115, 116. GERMAN DRAMA OF THE NINETEENTH CENTURY.—A study of leading dramatists from Kleist to Hauptmann. 4 s.h. SEYMOUR

117, 118. GERMAN CONVERSATION.—A course in writing and speaking German, restricted to German majors and other students by permission of the Department. 6 s.h. ALT AND SCHLIEWIENSKY

119, 120. SURVEY OF GERMAN LITERATURE.—German literature and its cultural background. First semester: From the beginnings to the romantic period. Second semester: From romanticism to the present. Lectures, reports and readings. 6 s.h. PHELPS AND WILLSON

125, 126. CONTEMPORARY GERMAN LITERATURE.—A study of representative works of the twentieth century. 4 s.h. DEINERT

131, 132. INTRODUCTION TO GOETHE.—The reading of his early novels and epics and works pertaining to his life. 4 s.h. SALINGER

133, 134. THE GERMAN LYRIC.—A survey of the development of German lyric poetry, principally from Klopstock to Rilke (with some attention to mediaeval and early modern poets), seen as poetic reflection of German thought. 4 s.h. SALINGER

191, 192. INDEPENDENT STUDY.—Directed reading and research. **Open only** to qualified students in the junior year, by permission of the Department. See p. 38. 6 s.h. DEINERT, PHELPS, SALINGER, AND WILLSON

201, 202. GOETHE.—A study of his life and works in the light of his lasting significance to world literature. 6 s.h. SALINGER

203, 204. EIGHTEENTH CENTURY.—Eighteenth-century German literature in its relation to contemporary European philosophy. 6 s.h. PHELPS

205, 206. MIDDLE HIGH GERMAN.—The language and literature of Germany's first classical period. 6 s.h. SEYMOUR AND JACKSON

207, 208. GERMAN ROMANTICISM.—The course covers the entire field of German romanticism from 1800. 6 s.h. WILLSON

209, 210. KLEIST, GRILLPARZER, AND HEBBEL.—The development of the drama in Germany and Austria between Schiller and Naturalism. 6 s.h. SALINGER AND WILLSON

211, 212. HEINRICH HEINE AND HIS TIME.—Heine's life and thought, and the contemporary European culture. 6 s.h. SALINGER

213. NINETEENTH-CENTURY LITERATURE.—From the end of Romanticism through Realism. Readings from Mörike, Büchner, Hebbel, Stifter, Keller, Meyer, Storm and Fontane. 3 s.h. DEINERT

214. THE TWENTIETH CENTURY.—From Naturalism to the present, with emphasis on Hauptmann, Hofmannsthal, George, Rilke, Mann, Kafka, Hesse, Broch, Musil, Brecht and Benn. 3 s.h. DEINERT

215. SEVENTEENTH-CENTURY LITERATURE.—A study of the leading writers of the Baroque, seen against the background of their time. 3 s.h. DEINERT

216. HISTORY OF THE GERMAN LANGUAGE.—The development of the phonology, morphology and syntax of German from earliest beginnings to the present. 3 s.h. SEYMOUR

218. THE TEACHING OF GERMAN.—Critical survey of modern teaching techniques; intensive practice in solving problems encountered in the teaching of German on the secondary and college levels. Analysis and evaluation of textbooks and related audio-visual materials with special emphasis on the utilization of the language laboratory. 3 s.h. PHELPS

DEPARTMENTAL MAJOR

1. *Prerequisites:* German 1-2 and 63-64, or equivalent.

2. *Major Requirements:* Twenty-four semester hours in the German Department. Twelve of these must be selected from the 200 courses. The remaining twelve may be selected from any courses in the 100 group. German 107, 108 does not count toward the major. German 117, 118, and 119, 120 (as well as Linguistics 101) are highly recommended to any student majoring in the Department.

3. *Related Work:* Eighteen semester hours, chosen from the humanities with the approval of the Germanic Languages Department.

HEALTH AND PHYSICAL EDUCATION

TRINITY COLLEGE AND THE COLLEGE OF ENGINEERING

MR. CAMERON, DIRECTOR; PROFESSOR FRIEDRICH, CHAIRMAN OF PHYSICAL EDUCATION AND ASSISTANT DIRECTOR OF PHYSICAL EDUCATION; PROFESSOR FALCONE; ASSOCIATE PROFESSORS BLY, COX, HARRISON, AND PERSONS; ASSISTANT PROFESSORS BUEHLER, CHAMBERS, SKINNER; MESSRS. BUBAS, HAGLER, HARVEY, LUTZ, AND WATERS, OWENS, DALY

REQUIRED PHYSICAL EDUCATION FOR MEN

A student must complete four semesters of physical education to fulfill graduation requirements.

All students are given a medical and physical examination before registration. Students who have physical handicaps must register in Adapted Physical Education—PE 11 and PE 12. Students assigned to these classes will take work adapted to their particular needs and capacities.

Students not assigned to adapted physical education will register in P.E. 1 and P.E. 2—Foundations of Physical Education. The fall program for freshmen has been specifically designed to provide the student with a broader concept of the "how" and "why" of physical activity. It includes an extensive battery of tests and involves such activities as interpretations of health and fitness, training techniques, relaxation techniques, weight control, body mechanics and posture control. Students are given an opportunity to become acquainted with various sports activities such as Tennis, Golf, Badminton, Volleyball, Handball, Paddleball, Basketball and Swimming.

On the basis of the test results and other factors such as body type, students are guided into those areas which can best help them develop their physical potential and provide for their future needs.

During the second semester students will be involved in activities best suited for them. These activities include: Wrestling, Gymnastics, Swimming, Track and Field and Individual Development.

After a student has completed Physical Education 1 and 2, he may complete his physical education requirement by electing and satisfactorily completing two courses from the following individual and team sports: 51. Gymnastics; 52. Badminton–Team Games; 53. Basketball–Handball; 56. Advanced Swimming, Life Saving and Water Safety; 57. Tennis–Volleyball; 58. Golf. A fee of $10.00 for the semester, payable at the Treasurer's Office, is charged for course 58, Golf. P.E. 61 and 62—Sophomore adapted P.E. is offered for those students who are assigned to this course by the health center. P.E. 63—Individual Development. This course which is open to all students includes conditioning, posture, weight control, fundamental movements, and weight training.

172. RECREATIONAL LEADERSHIP.—Theories and philosophies of play and recreation with application to community, school and family situations. HARRISON

WOMAN'S COLLEGE

PROFESSOR MCCUE, CHAIRMAN; PROFESSOR LEWIS, DIRECTOR OF UNDERGRADUATE STUDIES; ASSOCIATE PROFESSOR EDDY, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSOR BOOKHOUT; ASSOCIATE PROFESSORS HOLTON AND UHRHANE; ASSISTANT PROFESSORS LLOYD, SPANGLER, WOODYARD, AND WRAY; INSTRUCTOR RAYNOR

A student must complete four semester hours of physical education in order to fulfill graduation requirements. Ordinarily work must be completed by the end of the sophomore year. Classes meet three times a week or the equivalent thereof.

Each semester is divided into halves. In general, indoor activities are taught during the two winter half-semesters and outdoor activities in the fall and spring.

Every student must take one course (half-semester) in dance and one in swimming if she is unable to pass the swimming test. The remaining work necessary to complete the requirement may be elected from the activities listed in this section.

All students are given a physical and medical examination upon entering and at any other time when deemed necessary. Classes in adapted physical education and light sports are arranged for those who should not take the more active work.

Health and Physical Education

SPECIAL FRESHMAN PHYSICAL EDUCATION

At the beginning of the year, after a series of tests has been given, each freshman is registered for the course she most needs, as determined by the test scores. Courses in sports fundamentals, fundamentals of rhythm, beginning swimming, and posture and movement are offered for those who need to improve their skills in these areas. Students whose test scores are satisfactory will enroll in classes with the sophomores.

After the first half-semester all freshmen and sophomores enroll in classes together.

PHYSICAL EDUCATION ACTIVITIES

Individual and dual sports: archery, badminton, bowling, diving, fencing, golf, life saving, light sports, riding, stunts. tumbling, and apparatus, swimming, tennis, first aid, instructors' life saving, water safety, track, and field.

Team sports: basketball, hockey, softball, volleyball, "rec" ball, speedball.

Dance: folk dance, modern dance, square dance, tap dance.

Developmental Activities: posture and movement, posture, fundamental rhythms, sports fundamentals, and conditioning exercises.

The courses listed in this section are open for credit as follows: P.E. 91, 101, 117, 119, 181-182, 185, Health Education 101-102 open only to students preparing to teach physical education, with the exception of 91 which is open for credit to students in the Elementary Teaching Program. Physical Education 105-106, 113, 114, and Health Education 131, 134, 140, and 170, are open to all undergraduate students, both men and women.

91. FIRST AID AND SAFETY IN PHYSICAL EDUCATION.—A study of measures which must be taken to insure maximum safety in physical education programs; principles and practices in the care and prevention of athletic injuries. 1 s.h. (E) MISS LLOYD

101. HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION.—A survey of the relationship between physical education and social, political, and religious ideals of different nations and periods. Principles upon which physical education is based. A study of the physical, emotional, and social development of children at different ages with implications for physical education. Analysis of successful teaching. 3 s.h. (E) MISS MCCUE

102. THE TEACHING OF PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS.—A study of methods and materials for teaching physical education to children. Discussion of principles of physical education and practice in teaching elementary school activities. Required of students in the elementary school teaching program. 2 s.h. (E) MISS LEWIS

105-106. METHODS AND MATERIALS IN RECREATION.—A course intended to familiarize students with recreation activities and methods of organizing groups in these activities. Recommended for students interested in camping, scouting, YWCA work, and religious education. Laboratory work includes practical leadership experience with a recreational club or group in a city organization. Fields covered are: Social Activities, Music Activities, Folk and Square Dancing, Games and Sports, Arts and Crafts, Drama Activities. Open to juniors and seniors without prerequisite. Students who have had 102 may take 106 without 105. 6 s.h. (E) MISS HOLTON

113. MAMMALIAN ANATOMY.—A study of all organ systems with special emphasis an osteology, arthrology and myology. The cat is used as laboratory animal, but constant application is made to man. Not open to students who have had Zoology 53. Prerequisite: Zoology 1 and 2. 4 s.h. (E) MRS. BOOKHOUT

114. KINESIOLOGY.—A study of muscle function. Analysis of fundamental movements with emphasis on the development of normal posture and efficient body movement. Required of students taking the major in physical education. Prerequisites: Zoology 1 and 2, and P.E. 113 or Zoology 53. 3 s.h. (E) MRS. BOOKHOUT

117. PHYSICAL FITNESS AND INDIVIDUAL PHYSICAL EDUCATION.—An analysis of exercises designed to improve physical fitness of groups and to meet individual needs for which specific exercises are indicated. Theory of teaching individual and group gymnastics. 2 s.h. (E) MRS BOOKHOUT

119. ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION.—Curriculum building in physical education. The administration of class and intramural programs. Administrative problems such as budget, equipment, facilities, interschool athletics, legal aspects, and public relations. 2 s.h. (E) MISS MCCUE

120. EVALUATION AND MEASUREMENT IN PHYSICAL EDUCATION.—History of evaluation and measurement in physical education. Elementary statistics and application of statistical procedure in testing. Familiarity with athletic achievement tests for elementary and secondary schools, and with testing of sport techniques, rhythm, and general qualities of motor ability, motor capacity, and motor educability. 2 s.h. MRS. BOOKHOUT

181-182. METHODS AND MATERIALS IN PHYSICAL EDUCATION.—Includes basic theory and practice in teaching various types of dance, games, and sports. Laboratory hours are arranged to provide practice on the field and in the gymnasium. 6 s.h. (E) MISS LEWIS AND STAFF

185. ADVANCED METHODS AND MATERIALS IN PHYSICAL EDUCATION.—A continuation of 181-182. Required of senior majors in physical education. 3 s.h. (E) MISS LEWIS AND STAFF

HEALTH EDUCATION

101-102. HEALTH EDUCATION FUNDAMENTALS, METHODS, AND MATERIALS.—Designed specifically for and open only to physical education majors. Basic studies in personal and community health; administration; curriculum and program planning; health services and health counseling; selection, purchase, and care of equipment; library sources; methods and materials for effective health teaching; evaluation techniques and procedures. 6 s.h. (E) MISS UHRHANE

131. HEALTH PROBLEMS IN THE TWENTIETH CENTURY.—Examination of such topics as: mental health, use and abuse of alcohol and drugs; radiation hazards; atmospheric pollution; population explosion, mobility and migration; basic health and fitness; consumer evaluation and judgment in regard to health services, products and information. Open to sophomores. 3 s.h. (E) MISS UHRHANE

134. SCHOOL HEALTH.—Organization and administration of the school health program; basic health problems in schools; methods and materials for teaching health education. Primarily designed for students preparing to teach in elementary and secondary schools and for physical education majors. Open to juniors and seniors only. 2 s.h. (E) MISS UHRHANE

140. GEREOLOGY AND HEALTH.—Designed to help the college age person understand and appreciate the health problems of aging. Topics to be considered

will include: emotional health implications in the changing role of the aged in our society; housing plans, nursing homes and medical care; health problems related to the degenerative diseases, accident hazards; nutrition; and health implications of retirement and leisure time activities. Open to sophomores. 3 s.h. (E)
MISS UHRHANE

170. SPECIAL HEALTH PROBLEMS.—This course emphasizes economic, cultural and physical interrelationships operative in the creation and solution of health problems in: housing and city planning, water and waste control, food production and distribution, world health; and the effects on well-being of: killing and crippling diseases, handicapping conditions, medical care, philanthropic giving. Open to juniors and seniors only. 3 s.h. (E) MISS UHRHANE

REQUIREMENTS FOR TEACHING PHYSICAL EDUCATION AND HEALTH IN PUBLIC SCHOOLS

The following requirements have been set up for students in the Teaching Program who wish to qualify as full-time teachers of Physical Education and Health. The requirements meet the standards of the North Carolina Department of Public Instruction for certification in Physical Education and Health and of many of the other states represented in the student body. Students preparing to teach in any state are advised to consult the Department of Education about specific requirements.

Prerequisites: Physical Education 91 and 101. Zoology 1-2.

Major Requirements: 24 s.h. including Physical Education 114, 117, 119, 120, 181-182, 185, and Health Education 101-102.

Related Work: Sufficient work in subjects required for certification for teaching Physical Education and Health. Of these, 8 hours must be in anatomy and physiology (P.E. 113, Mammalian Anatomy, and Zoology 151, Principles of Physiology). For the remaining hours work done in the Department of Education leading to teacher certification is acceptable. Courses in health education, chemistry, zoology, sociology, psychology, art, music, and physical education are recommended.

HINDI-URDU

181, 182. INTENSIVE ELEMENTARY HINDUSTANI.—Four hours of classroom work, two hours of language drill. Concentration on the acquisition of conversational ability in Hindustani, with a grammar and vocabulary basic to both Hindi and Urdu. Introduction to the Devanagari script, and the reading of graded texts. 8 s.h. SWAN

183, 184. INTENSIVE INTERMEDIATE HINDUSTANI.—Four hours of classroom work, two hours of language drill. Advanced conversation in Hindustani. Reading and Composition. Introduction to the Nastaliq script. (Prerequisite: Elementary Hindustani.) 8 s.h. SWAN

HINDI 185, 186. ADVANCED HINDI READING AND COMPOSITION.—An introduction to scholarly and literary Hindi prose, and extensive practice in composition. Prerequisite: Hindustani 183, 184, or equivalent. 6 s.h. SWAN

200, 201. SPECIAL STUDIES IN SOUTH ASIAN LANGUAGES.—Intensive concentration in advanced Hindi reading and conversation, or specialized, graded work in cognate South Asian languages necessary for the advanced student contemplating field work in South Asia. Prerequisite: Consent of instructor. 6 s.h.
SWAN AND STAFF

These courses are offered as an enrichment program for students interested in the South Asian subcontinent and may be taken as general electives by advanced undergraduate students. No major work is offered in Hindi-Urdu.

HISTORY

PROFESSOR WATSON, CHAIRMAN; PROFESSOR COLTON, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR ROPP, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS ALDEN, CRANE, CURTISS, FERGUSON, HAMILTON, HOLLEY, LANNING, MANCHESTER, NELSON, PARKER, AND WOODY; VISITING PROFESSOR MANSERGH; ASSOCIATE PROFESSORS ACOMB, DAVIS, DURDEN, HOLLYDAY, W. SCOTT, VAN AKEN, AND YOUNG; ASSISTANT PROFESSORS GILLIN, LERNER, AND A. SCOTT; INSTRUCTORS CELL, GINTER, MAUSKOPF, STAUDE, AND WALL; MR. HOFFNER AND MR. KIRKLAND

The undergraduate courses in history are designed to afford (1) an introduction to the study of history by a consideration of the history of the modern world; (2) a more intensive study of general American history; (3) opportunities for more advanced study of phases of American, English, European, Hispanic-American, Russian, and Asian history.

Course 1-2 or 51-52 or the equivalent is a prerequisite for all other courses; courses 91 and 92 are prerequisite for all 100 and 200 courses in United States history. However, seniors with written permission from the instructor may take advanced American history courses without having had 91 and 92. Sophomores who took only one semester of course 1-2 in the freshman year may take courses 91, 92, 95, 96 or 99 concurrently with the second semester, provided they made a grade of B or above on the semester taken. Sophomores must obtain permission of the instructor in order to be admitted to courses numbered above 100; students who are not fully qualified sophomores will not be admitted to these courses. Courses for seniors and graduates are limited to twenty-five students; juniors may not elect them without special permission from the Department and the Executive Committee of the Graduate Faculty.

1, 2. MODERN HISTORY.—With special reference to the issues in the modern world. Topics selected for emphasis: the contest between liberty and authority in the modern state; changing economic organization and theory—capitalism and the challenges to it; the problems of peace and war among the states; the changing faiths men live and die by. Beginning about 1500 with the rise of the European dynastic states, the story is pursued in the first semester to approximately 1848, and in the second through the two great world wars. The central theme in both semesters is the expansion of the influence of Western Europe throughout the world, with some attention to the rise of the United States as a world power. 6 s.h. (E & W)

Sophomores and juniors are not admitted to this course.

FERGUSON, MANCHESTER, AND ROPP; MISS ACOMB, HOLLYDAY, AND YOUNG; GILLIN AND LERNER; CELL, GINTER, KIRKLAND, MAUSKOPF, STAUDE, AND WALL

51, 52. MODERN HISTORY.—An introductory course for sophomores, juniors, and seniors dealing with the topics indicated in the description of course 1-2. 6 s.h. (E & W) PARKER; MISS ACOMB, HOLLYDAY, W. SCOTT, AND YOUNG; CELL AND MAUSKOPF

51X, 52X. MODERN HISTORY.—For seniors who have had no other history at Duke. The topics covered will be essentially the same as those indicated in the description of History 1-2. 6 s.h. (W) ROPP

91. THE DEVELOPMENT OF AMERICAN DEMOCRACY TO 1865.—A study of the trends vital to an understanding of the United States today. The main theme is the development of American democracy. Problems of foreign policy, the growth of capitalism, political practices, social behavior, and conflicting ideals are considered in relation to this main theme. 3 s.h. (E & W)

HOLLEY; DAVIS, DURDEN, AND VAN AKEN; MRS. A. SCOTT; HOFFNER AND WALL

92. THE DEVELOPMENT OF AMERICAN DEMOCRACY, 1865 TO THE PRESENT.—A continuation of History 91 with emphasis upon the emergence of contemporary problems. 3 s.h. (E & W)

HOLLEY; DAVIS, DURDEN, AND VAN AKEN; MRS. A. SCOTT; HOFFNER AND WALL

Courses 91 and 92 are intended both to serve as continuation courses in the study of history and to afford the student an opportunity to gain the understanding of the past of the United States essential for intelligent citizenship. These courses

are prerequisite for all 100 and 200 courses in United States history, but this prerequisite may be waived for seniors by written permission of the instructor.

95, 96. ANCIENT AND MEDIEVAL HISTORY.—The history of mankind from preliterate man through the development of the characteristic institutions of Western Europe. The first semester considers the prehistoric tribes, the early cultures of Mesopotamia and Egypt, the religious contribution of the Hebrews, and classical Greece and Rome. The second semester deals with Europe in the Middle Ages, from Constantine to Columbus, with emphasis upon institutional and cultural development. 6 s.h. (E) YOUNG

99. NAVAL HISTORY AND ELEMENTARY STRATEGY.—After a review of earlier periods, attention is given to the rise of sea-power and its importance in more recent times and to naval actions, especially in the two World Wars. This course is not open to students who have had N.S. 102. 3 s.h. (W) ROPP

105, 106. POLITICAL AND CONSTITUTIONAL HISTORY OF ENGLAND.—The origins and evolution of the principal institutions of the English government, related to their setting in a changing society. 6 s.h. (W) GINTER

107, 108. SOCIAL AND CULTURAL HISTORY OF ENGLAND.—English history from the fourteenth century to the present time in an effort to arrive at a synthesis of social and political events and thus provide a background for the study of English literature. Emphasis is placed on the ages of Chaucer, Shakespeare, and Milton; the eighteenth and early nineteenth centuries; the reign of Victoria and the twentieth century. 6 s.h. (E) FERGUSON

Sophomores who made an average grade of B or above on course 1-2 may be admitted to this course.

109, 110. HISTORY OF ROME.—History of the Roman State from its beginnings to the death of Justinian; its expansion; development of its constitution and public administration; social, legal, political and economic problems of perennial life and interest; the background and setting of Christianity's rise and growth. (This course carries no language credit. No knowledge of Latin is required for admission.) (Latin 131, 132) 6 s.h. (E) ROGERS

111, 112. AMERICA IN THE COLONIAL AND EARLY MODERN ERA.—Lectures upon the history of America from the discovery to the beginning of the Civil War. They will be primarily concerned with things political, institutional, and social, with occasional discussions of intellectual and cultural advance. 6 s.h. ALDEN

113, 114. AMERICA IN THE TWELFTH CENTURY.—Political, economic, and social problems of twentieth-century United States. Emphasis is placed on reform movements from the Muckrakers through the Fair Deal, the emergence of the United States as a world power, and conflicting ideas and ideologies. 6 s.h. (W) WATSON

121, 122. FOREIGN RELATIONS OF THE UNITED STATES, 1775 TO THE PRESENT (first semester to 1898).—With emphasis on social and economic currents as well as on diplomacy. 6 s.h. (W) DAVIS

123. CITY AND FRONTIER IN AMERICAN HISTORY 1607-1880.—The westward movement and the progress of urbanization with special attention to the social and political consequences. 3 s.h. (E) MRS. A. SCOTT

124. CITY AND FRONTIER IN AMERICAN HISTORY 1880 TO THE PRESENT.—A continuation of History 123 covering the later movement to the West and the urbanization of the post Civil War period. 3 s.h. (E) MRS. A. SCOTT

127. HISTORY OF LATIN AMERICA THROUGH THE FORMATION OF THE NATIONAL GOVERNMENTS.—3 s.h. (W) LANNING AND VAN AKEN

128. INTER-AMERICAN AFFAIRS.—This course treats the relations of the Latin-American states with each other and with the United States with the design of explaining the current significance of Latin America. Chief emphasis is placed upon social problems and movements common to all the republics and upon the role of the United States in Latin-American affairs, including such topics as American intervention; contributions of the United States to Latin-American life in such matters as public health; Pan-Americanism; Pan-Hispanism; foreign pene-

tration and ideologies; the cultural and commercial aspects of the Good Neighbor Policy; Latin-American states in the World Wars. 3 s.h. (w) LANNING

131, 132. THE DEVELOPMENT OF THE MAJOR SOUTH AMERICAN POWERS.—Political, social, and economic history of Argentina, Brazil, and Chile since independence. First semester to 1890; second semester to the present day. 6 s.h. VAN AKEN

135, 136. EUROPE IN THE TWENTIETH CENTURY.—Political, economic, and intellectual developments in Europe since 1900. First semester to 1933; second semester to the present day. 6 s.h. (w) COLTON

137, 138. FOREIGN RELATIONS OF THE EUROPEAN POWERS.—European diplomacy and Europe's position in the world since 1870, with an introductory survey of diplomatic institutions since the Renaissance. 6 s.h. (w) W. SCOTT

139, 140. NINETEENTH-CENTURY EUROPE.—With special attention to Germany and Austria-Hungary, this course emphasizes the development of European nationalism and the clash of freedom and authority. 6 s.h. (w) HOLLYDAY

141, 142. CHINA AND JAPAN IN MODERN TIMES.—A history of their response to the West between 1750 and the present, with some attention to their cultural background. 6 s.h. GILLIN

147. THE HISTORY OF INDIA TO 1757: A SURVEY.—The history of the Indian sub-continent; classical Hindu civilization; the coming of Islam; the Mughal Empire; European penetration and rivalries; the establishment of British supremacy. 3 s.h. (w) CRANE

148. THE HISTORY OF INDIA, 1757 TO THE PRESENT: A SURVEY.—The East India Company; British impact; the Indian Mutiny; the nature and effects of Crown Rule; Indian nationalism; Muslim nationalism; the Gandhian Era; the transfer of power; partition and independence; the contemporary scene. 3 s.h. (w) CRANE

153, 154. THE HISTORY OF THE SOUTH.—A study, beginning in the Colonial period, of the development of the Southern part of the United States with particular attention to its distinctive characteristics and institutions and to their influence in shaping Southern attitudes toward major questions of national policy. 6 s.h. (w) WOODY

157, 158. THE RISE OF MODERN SCIENCE.—A historical survey of the development of scientific ideas. First semester, science in antiquity to Galileo; second semester, seventeenth to twentieth century. 6 s.h. MAUSKOPF

161, 162. RUSSIA FROM IVAN THE TERRIBLE TO PRESENT TIMES.—Topics treated include the rise of the Russian state and its relations with Poland and Turkey; the agrarian problem and the rise of industry; the Russian Revolution; the political, agricultural and industrial policies of the Soviet Union; the role of the U.S.S.R. in World War II; and its postwar policies. 6 s.h. (w) CURTISS AND LERNER

163, 164. REFORM AND POLITICS IN NINETEENTH CENTURY AMERICA.—First semester: the coming of the Civil War with emphasis on the reform movements of the Jackson era, and anti-slavery crusade and national politics to 1865. Second semester: reform and politics from the Reconstruction era to the Farmers' Revolt of the 1890's. 6 s.h. (w) DURDEN

FOR SENIORS AND GRADUATES

Students may receive credit for either semester of a hyphenated course at the 200-level without taking the other semester if they obtain written permission from the instructor and either the Director of Undergraduate or the Director of Graduate Studies.

201-202. THE HISTORY OF RUSSIA, 1801-1917.—The development of the Russian Empire in its political, social, and economic aspects, and the growth of forces leading to its downfall. 6 s.h. CURTISS

203-204. THE UNITED STATES, 1850-1900.—The rise of sectionalism, secession, war-time problems of the Union and Confederacy, political and economic adjustments of Reconstruction, the status of the Negro, the New South, problems of

capital and labor, the agrarian revolt, political parties and reform, the Spanish-American War. 6 s.h. (w) WOODY

205-206. THE UNITED STATES IN THE TWENTIETH CENTURY.—The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administrations. (Not open to students who have had History 113.) 6 s.h. (w) WATSON

212. RECENT INTERPRETATIONS OF UNITED STATES HISTORY.—A course designed to encourage a critical evaluation of major issues in United States history through examination of recent interpretations of key problems. 3 s.h. (w) WATSON

Open only to history graduate students and seniors doing practice teaching in one of their final two semesters.

213-214. THE OLD SOUTH.—Political thought and party trends from Jefferson to Calhoun; agriculture, slavery, expansion; commerce, manufacturing, transportation; urban life, religion, education; the rise of Southern nationalism. 6 s.h. (w) WOODY

215-216. THE DIPLOMATIC HISTORY OF THE UNITED STATES.—A study of the history of American diplomacy, with particular emphasis on those factors, foreign and domestic, which have shaped the foreign policies of the Republic. 6 s.h. (w) DAVIS

221-222. THE AGE OF THE RENAISSANCE.—The decline of characteristic features of medieval civilization and the rise of modern European institutions with particular attention to intellectual movements from Dante to Erasmus. 6 s.h. (E) NELSON

223-224. THE OLD REGIME AND THE FRENCH REVOLUTION, 1661-1815.—A study of social, political, and intellectual revolutions in continental Europe, centering on France and giving special attention to successive interpretations of historical change. 6 s.h. MISS ACOMB

225. THE AGE OF THE REFORMATION.—History and thought of European Christianity between 1517 and 1680. 3 s.h. [Listed also in the Department of Religion as Religion 250] HILLERBRAND

227, 228. EUROPE IN THE NINETEENTH CENTURY.—A study, beginning with the career of Napoleon Bonaparte, of the forces and personalities influential in the nineteenth century. Emphasis in the first semester is on the problems of the biographer; in the second, on those of a student of national communities. 6 s.h. (w) PARKER

229. RECENT INTERPRETATIONS OF MODERN EUROPEAN HISTORY.—A course designed to develop the ability to appraise critical historical issues through the study and discussion of recent interpretations of key historical problems in modern European history. 3 s.h. PARKER

Open only to history graduate students and seniors doing practice teaching in one of their final two semesters.

231-232. THE HISPANIC COLONIES AND REPUBLICS IN AMERICA.—6 s.h. (w) LANNING

233-234. THE INSTITUTIONAL, CULTURAL, AND SOCIAL HISTORY OF HISPANIC AMERICA.—The first semester deals with the culture, society, and institutions of the Spanish colonies in America and the second semester with those of the Hispanic American republics. 6 s.h. (w) LANNING

235, 236. EUROPEAN EXPANSION OVERSEAS (1415-1898).—A course dealing primarily with the processes by which European institutions were carried overseas and modified in a new environment. In the first semester the emphasis is on Portuguese, Dutch, French, and English experience in the Far East and the Americas to 1763. In the second semester, attention is paid to the emergence of independent centers of European culture, as in Brazil, and to the revivals of mercantile imperialism of the new German, French, Italian and British empires of the nineteenth century. 6 s.h. (w) MANCHESTER

237-238. EUROPE IN THE MIDDLE AGES, 395-1500.—Attention is given both to distinctive attributes of the period, such as feudalism and scholastic learning, and to such formative elements of European civilization as nationalism and the universities. 6 s.h. YOUNG

241-242. NATIONALISM AND COMMUNISM IN THE FAR EAST.—The growth of nationalism in China and Japan, culminating in Japan's invasion of China and the subsequent rise to power of the Chinese Communists. 6 s.h. GILLIN

245-246. WAR IN THE MODERN WORLD.—This course is concerned with the relations between warfare and modern political, economic, and social conditions. Special attention is given to the development of British and American military methods and to the events of the American Civil War and the two World Wars. The work in the first semester deals with Clausewitz's theories of warfare and the period from the introduction of gunpowder to 1871; in the second semester there is a more detailed analysis of recent land, sea, and air warfare. 6 s.h. (w) ROPP

247. THE HISTORY OF MODERN INDIA, 1757-1857.—Historiography of the period; the western impact on the sub-continent; the expansion of Company power; the background and nature of the Indian Mutiny; problems in historical analysis and interpretation. 3 s.h. (w) CRANE

248. THE HISTORY OF MODERN INDIA AND PAKISTAN, 1857-1947.—Historiography of the period; Crown rule; social change; modernization and the economy of the sub-continent; development of nationalism; the Gandhian era and Muslim separatism; the transfer of power and partition; problems of independence. 3 s.h. (w) CRANE

249-250. SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES.—The interplay of ideas and social practice through the examination of attitudes and institutions in such fields as science and technology, law, learning, and religion. 6 s.h. (w) HOLLEY

251-252. RECENT EUROPEAN HISTORY.—A history of political and economic developments in Western Europe since 1870. 6 s.h. (w) COLTON
Not open to students who have had 135, 136.

259-260. THE EMERGENCE OF THE NEW SOUTH 1865 TO THE PRESENT.—Reconstruction, industrialization, and agrarian revolt; changing status of the Negro; the South's role in the reform movements headed by Theodore Roosevelt, Woodrow Wilson, and Franklin D. Roosevelt. 6 s.h. DURDEN

261-262. RUSSIA SINCE 1917.—A study of the background of the Revolution of 1917 followed by an analysis of the history and policies of the Soviet state. 6 s.h. (w)
Not open to students who have had 161-162. LERNER

263-264. AMERICAN COLONIAL HISTORY AND THE REVOLUTION, 1607-1789.—The founding and institutional development of the English colonies; the background, progress, and results of the Revolution. 6 s.h. (w) ALDEN

265-266. MODERN SOUTH AMERICA.—Political, social, and economic history of the leading South American nations from the mid-nineteenth century to the present. 6 s.h. (w) VAN AKEN

267, 268. FROM MEDIEVAL TO EARLY MODERN ENGLAND.—The intellectual, social, and political problems of transition to modern England, with special emphasis on the English Renaissance. 6 s.h. (w) FERGUSON
Not open to students who have had 107.

269. BRITISH HISTORY FROM 1714 TO 1867.—The interrelationship of the leadership of such men as Walpone, Chatham, Pitt, and Peel with war, revolution, and social institutions; the rise of the cabinet system; the Industrial Revolution; imperial changes; and reform. 3 s.h. (w) HAMILTON

270. GREAT BRITAIN AND THE COMMONWEALTH OF NATIONS, 1867 TO THE PRESENT.—A history of Great Britain at the height of her world dominance and beyond, her oceanic empire, and the evolution of that empire into a unique world-wide Commonwealth of Nations. 3 s.h. (w) HAMILTON

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the formation of the

classical civilization of the Indian sub-continent from the prehistoric Indus Age to the Gupta Period (4th century A.D.). Attention will be given to the development of political, economic, social and religious movements and institutions. 3 s.h. [Listed also in the Department of Religion as Religion 285] SULLIVAN

297. THE BRITISH EMPIRE IN THE NINETEENTH CENTURY (FROM 1783).—3 s.h. (w)

298. THE COMMONWEALTH IN THE TWENTIETH CENTURY.—3 s.h. (w) MANSERGH

INDEPENDENT STUDY

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to juniors with a B average in History and in their over-all work. Admission will be subject to approval of the individual instructor and the Department. 6 s.h. STAFF

193, 194. INDEPENDENT STUDY.—Same as 191, 192, but for seniors. 6 or 12 s.h. STAFF

UNDERGRADUATE SEMINARS

Prerequisites: History 1, 2 (or 51, 52) and History 91, 92 (except for History 195A-196A) and the consent of the instructor.

The following seminars are designed to offer opportunities for reading and historical investigation in significant problems. Juniors as well as seniors may apply for admission to these courses, and are urged to do so if they expect to be candidates for graduation with distinction in history or if they expect to practice-teach in their senior year. All seminars are open to non-majors as well as to majors.

195A-196A. THE BACKGROUND OF MODERN EUROPEAN CIVILIZATION.—Topics in intellectual-cultural history of Europe and adjacent areas from the earliest records to 1648. The work aims to develop critical appreciation and maturity of judgment through using primary sources. 6 s.h. (E) NELSON

195B-196B. SEMINAR IN TWENTIETH-CENTURY EUROPE.—6 s.h. (w) *Students may not receive credit for this course and 251-252.* COLTON

195C-196C. PROBLEMS IN AMERICAN INTELLECTUAL HISTORY.—6 s.h. (w) HOLLEY

Students may not receive credit for this course and 249-250.

195D-196D. THE PROGRESSIVE ERA THROUGH THE NEW DEAL.—6 s.h. (w) WATSON

195E-196E. SEMINAR IN AMERICAN HISTORY BEFORE 1789.—6 s.h. (w) ALDEN

195F-196F. PROBLEMS IN NINETEENTH CENTURY AMERICAN REFORM AND POLITICS.—6 s.h. DURDEN

Students may not receive credit for this course and 163-164.

195G-196G. NATIONALISM AND COMMUNISM IN THE FAR EAST.—This course will combine general reading and discussion with occasional lectures and specialized research on the events and forces underlying developments in China, Japan, and other Far Eastern areas during the 19th and 20th centuries. 6 s.h. GILLIN

195H-196H. FROM RURAL TO URBAN SOCIETY IN THE UNITED STATES.—6 s.h. MRS. A. SCOTT

195I-196I. NATIONALISM AND FREEDOM IN NINETEENTH CENTURY EUROPE.—6 s.h. HOLLYDAY

195J-196J. THE HISTORY OF INTERNATIONAL SOCIALISM AND COMMUNISM.—International Socialist and Communist movements from Utopian Socialism to the present. 6 s.h. LERNER

197-198. SENIOR HONORS SEMINAR.—A course designed to introduce qualified students to advanced methods of historical research and writing and to the appraisal of critical historical issues. Open only to seniors, but not restricted to candidates for degree with distinction. This course, when taken by a history

major, would be in addition to the 6 semester hours required in 195-196 seminars or 200-level courses of the History Department. 6 s.h. HOLLEY AND PARKER

DEPARTMENTAL MAJOR

Prerequisite: The Introductory Course in History (1-2 or 51-52).

Major Requirements: Students desiring to take a major in history are required to elect, in addition to History 1-2 or 51-52, 24 semester hours in the Department, including six semester hours in either an undergraduate seminar (195-196) or any course in the 200 group. Students are urged to take History 91-92; in any case those wishing to take the more advanced courses in American history should elect History 91-92 in the sophomore or junior year.

Honors: Any student who is qualified (see the section on Honors in this *Bulletin* for general requirements) may undertake work leading to a degree with distinction in History by presenting himself to his History faculty advisor as a candidate. Normally, Honors work involves participation in one of the Undergraduate Seminars during the junior year and selection for the Senior Honors Seminar in the senior year. Further information is available at the History Department office (236 Allen).

COURSES APPROVED FOR RELATED WORK IN HISTORY

Art; History of Art
Economics, but not the courses listed under business administration and accounting except those in economic geography
Education, 54, 104, 225
English and American literature, but not composition, speech, and drama (except 119)
German, Greek, Latin, Russian, and the Romance Languages: the literature courses numbered 100 or above that are not primarily conversation or composition courses
Greek, Latin, except those courses that are primarily grammar or composition
Linguistics, 101
Music; History of Music
Philosophy, except 48
Political Science
Psychology, 91, 100, 101
Religion, especially those numbered above 100
Sociology

HONORS-MASTERS PROGRAM

For a brief description of this program see page 38 of this *Bulletin*.

COLLOQUIUM 101, 102. THE UNIVERSITY AND THE SCHOLAR.—Selected readings and informal discussions about such topics as the role of universities and teacher-scholars, the history of Duke University, the art of teaching, academic freedom, scholarly writing, and other related matters. 2 s.h.

ITALIAN

For courses offered in Italian, see *Romance Languages*, page 127.

LINGUISTICS

The courses in Linguistics may be taken as electives by advanced students; certain courses serve as related work in several departments (see the entries for related work under the separate departments).

No major is offered in Linguistics. Students interested in the study of language as a part of their undergraduate program or as a preparation for graduate work in linguistics should consult the instructors of the courses listed below.

101. INTRODUCTION TO LINGUISTICS.—Origin and nature of language, methods of descriptive linguistics with reference to historical and comparative linguistics. No specific prerequisite. Sophomore standing. 3 s.h. SEYMOUR

For a description of the following courses consult the listings under the specified department.

DEVELOPMENT OF THE ENGLISH LANGUAGE (English 161)	
MODERN ENGLISH GRAMMAR (English 162)	CLOGAN
OLD ENGLISH GRAMMAR AND READINGS (English 207)	LUMIANSKY AND NYGARD
HISTORY OF THE ENGLISH LANGUAGE (English 208)	LUMIANSKY AND NYGARD
OLD FRENCH LITERATURE (French 219)	VINCENT
MIDDLE HIGH GERMAN (German 205, 206)	SEYMOUR
HISTORY OF THE GERMAN LANGUAGE (German 216)	SEYMOUR
PHILOSOPHY OF LANGUAGE (Philosophy 109)	WELSH
ROMANCE LINGUISTICS (Romance Languages 224)	HULL
CULTURAL ANTHROPOLOGY (Sociology 94)	LABARRE
LANGUAGE AND SOCIETY (Sociology 238)	MCCORMACK
OLD SPANISH LANGUAGE (Spanish 275)	DAVIS

MATHEMATICS

PROFESSOR GERGEN, CHAIRMAN; PROFESSOR DRESSEL, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR HICKSON, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS CARLITZ, ELLIOTT, MURRAY, ROBERTS, AND THOMAS; VISITING PROFESSOR NAGAMI; ASSOCIATE PROFESSORS GALLIE, REYNOLDS, SHOENFIELD, WARNER, AND WILLIAMS; ASSISTANT PROFESSORS BRYSON, BURDICK, HARRIS, HINRICHS, KELINGOS, KITCHEN, PATRICK, SCOVILLE, SMITH, AND STACKELBERG; MESSRS. BOOTH, CROCKETT, ELLIS, ENTWHISTLE, FRANKE, GALANTI, GORDON, KAIT, MACDONALD, MCINTYRE, MEANS, MULLEN, QUIMBY, SCHORR, TANK, WILDE, AND WUENSCH

The following program of courses in Mathematics is planned for 1965-66. Fall: 11, 17, 21, 22, 41, 63, 64, 83, 111, 113, 135, 139, 141, 183, 217, 221, 233, 235, 271, 283, 285, 287, 291. Spring: 18, 21, 22, 42, 63, 64, 84, 112, 114, 131, 136, 140, 142, 184, 204, 218, 221, 222, 234, 236, 244, 272, 288, 292.

11. ALGEBRA AND TRIGONOMETRY.—Factoring, fractions, linear equations in one or several unknowns, introduction to coordinates and graphing, exponents and radicals, numerical trigonometry. Prerequisite: two units of college preparatory mathematics. 3 s.h. (E & W) STAFF

17. INTRODUCTION TO FINITE MATHEMATICS.—A course designed to introduce students to some of the concepts in modern mathematics. Elementary logic, sets and subsets, vectors and matrices, and probability theory are studied. Some applications of these topics to the biological, social, and physical sciences are considered. Prerequisite: two and one-half units of college preparatory mathematics. 3 s.h. (W) STAFF

18. ELEMENTARY STATISTICS.—An introduction to statistics with emphasis on fundamental concepts. Topics studied include summarization of data, mean and standard deviation, normal, binomial and other distributions, sampling, statistical estimation, and testing hypotheses. Prerequisites: Mathematics 17. 3 s.h. (W) STAFF

21, 22. INTRODUCTORY CALCULUS.—Real and complex numbers, rectangular and polar coordinates, graphs, trigonometric and inverse trigonometric functions, logarithmic and exponential functions, conic sections, limits, derivatives, maxima and minima, methods of integration, areas, volumes. Prerequisite: two and one-half units of college preparatory mathematics. Mathematics 21 is prerequisite for Mathematics 22. 6 s.h. (E & W) STAFF

41, 42. INTRODUCTORY CALCULUS.—A special course covering the topics of Mathematics 21, 22 in a more extensive and rigorous fashion, designed for students who have demonstrated marked proficiency in mathematics. Credit for this course

and Mathematics 21, 22 is not allowed. Prerequisite: four units of college preparatory mathematics. 6 s.h. (w) STAFF

63, 64. INTERMEDIATE CALCULUS.—Moments, centroids, indeterminate forms, Taylor's formula, approximation of integrals, improper integrals, infinite series, vectors and solid analytic geometry, partial derivatives, multiple integrals, introduction to ordinary differential equations. Prerequisite: Mathematics 22 for 63; and 63 for 64. 6 s.h. (w) STAFF

83, 84. INTERMEDIATE CALCULUS.—A continuation of Mathematics 41, 42, with coverage including the topics of Mathematics 63, 64 and related basic topics in mathematics. Credit for this course and Mathematics 63, 64 is not allowed. Prerequisite: Mathematics 42 for 83; and 83 for 84; or permission of the Director of Undergraduate Studies in Mathematics. 6 s.h. (w) STAFF

111. APPLIED MATHEMATICAL ANALYSIS I.—Ordinary and partial linear differential equations with constant coefficients, Fourier series and their applications, vectors. Not open to students who have had Mathematics 131. Prerequisite: Mathematics 64. 3 s.h. (w) STAFF

112. APPLIED MATHEMATICAL ANALYSIS II.—Complex variables, residues, conformal mapping, matrices, Laplace and Fourier Transforms and their applications. Prerequisite: Mathematics 64. 3 s.h. (w) STAFF

113, 114. MODERN ALGEBRA.—Vector spaces, linear transformations, matrices, elementary theory of groups, rings, and fields. Prerequisite: Mathematics 63 for 113; and 113 for 114. 6 s.h. (w) HINRICHS

131. ELEMENTARY DIFFERENTIAL EQUATIONS.—Solution of differential equations of elementary types; formation and integration of equations arising in applications. Not open to students who have had Mathematics 111. Prerequisite: Mathematics 63. 3 s.h. (w) STAFF

135, 136. PROBABILITY AND STATISTICS.—Permutations and combinations, total and compound probability, Bayes' formula, Bernoulli's theorem, discrete distributions, central values, moments and mathematical expectation, law of large numbers, probabilities in continuum, continuous distributions, sampling distributions, confidence limits, tests of hypotheses, and analysis of variance. Prerequisite: Mathematics 63 for 135; and 135 for 136. 6 s.h. (w) BURDICK

139, 140. ADVANCED CALCULUS.—Multiple integrals and Jacobians, infinite series, power series, differential equations, vector analysis, line and surface integrals, Green's theorem, Stoke's theorem, improper integrals. Prerequisite: Mathematics 64 for 139; and 139 for 140. 6 s.h. (w) ELLIOTT

141, 142. JUNIOR MATHEMATICS SEMINAR.—An honors course designed to coordinate and advance the mathematical knowledge of students who have demonstrated marked proficiency in mathematics and who desire intensive and rigorous work in this subject. Student reports will be required. Prerequisite: Mathematics 84 for 141; and 141 for 142; or permission of the Director of Undergraduate Studies in Mathematics. 6 s.h. (w) KITCHEN

183, 184. SENIOR MATHEMATICS SEMINAR.—An honors course continuing the work in Mathematics 141, 142, designed primarily for seniors. Prerequisites: Mathematics 141 and 142 for 183; and 183 for 184. Mathematics 183 and 184 must be preceded or accompanied respectively by Mathematics 217 and 218. 6 s.h. (w) KITCHEN

FOR SENIORS AND GRADUATES

204. GEOMETRY FOR TEACHERS.—The metric and synthetic approaches to plane and solid geometry are investigated. Affine geometry and an algebraic model of Euclidean geometry are discussed. 3 s.h. REYNOLDS

217, 218. ANALYSIS.—Introduction to set theory, construction of real and complex numbers beginning with the Peano postulates, elementary topology of real and complex numbers, properties of continuous functions, derivatives, mean value theorem, Riemann integral, fundamental theorem of integral calculus. Prerequisite: Mathematics 64 for 217; and 217 for 218. 6 s.h. (w) KELINGOS

221. DIGITAL COMPUTER.—History of computers; number representation, in-

formation storage, logical arithmetic; components and organization of computing systems; coding and programming; programmed arithmetics, function and functional subroutines, interpretive routines, compilers; error analysis. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. The fee is payable to the Treasurer's Office of Duke University at the beginning of the semester. Prerequisite: Mathematics 22. 3 s.h. (w) PATRICK

222. INTRODUCTION TO NUMERICAL ANALYSIS.—Introduction to numerical analysis, error analysis, real and complex roots of equations, finite difference methods and theory of interpolation, numerical differentiation and integration, numerical integration of ordinary and partial differential equations, simultaneous equations and matrix inversion. Prerequisite: Mathematics 64 and 221. 3 s.h. (w) GALLIE

227, 228. THEORY OF NUMBERS.—Congruences, arithmetic functions, compound moduli, quadratic reciprocity, Gauss sums, quadratic forms, sums of squares. Prerequisite: Mathematics 64 for 227; and 227 for 228. 6 s.h. (w) CARLITZ

229, 230. ALGEBRAIC NUMBERS.—Ideals, unique factorization, divisors of the discriminant, determination of the class number. Prerequisite: Mathematics 113 for 229; and 229 for 230. 6 s.h. (w) CARLITZ

233. STATISTICAL METHODS.—Parameter estimation and hypothesis testing from samples, linear regression, correlation, analysis of variance and covariance, components of variance, multiple regression. 3 s.h. (w) BRYSON

234. SAMPLE DESIGNS.—Methods of constructing and analyzing survey designs; elements of simple random sampling, stratified sampling, multi-stage sampling; methods of estimation; questionnaire construction; refusals and not-at-homes. Prerequisite: Mathematics 233. 3 s.h. (w) BRYSON

235, 236. ABSTRACT ALGEBRA.—Groups, fields, rings, matrices, quadratic and bilinear forms, general Galois theory, hypercomplex systems. Prerequisite: Mathematics 64 for 235; and 235 for 236. 6 s.h. (w) THOMAS

244. DESIGN OF EXPERIMENTS.—Methods of constructing and analyzing designs for experimental investigation, Latin square, split-plot, simple and partially confounded factorial designs, incomplete block designs, treatment of missing data, techniques of experimentation. Prerequisite: Mathematics 233. 3 s.h. (w) BURDICK

247, 248. ARITHMETIC OF POLYNOMIALS.—Field theory, detailed study of finite fields, special polynomials and functions, valuation theory, the zeta function. Prerequisite: Mathematics 235 or consent of the instructor for 247; and 247 for 248. 6 s.h. (w) CARLITZ

253, 254. DIFFERENTIAL GEOMETRY.—Curves and surfaces in three dimensional Euclidean space, applicability, differential parameters, Riemannian geometry of n-space. Prerequisite: Mathematics 64 for 253; and 253 for 254. 6 s.h. (w) THOMAS

271, 272. INTRODUCTORY TOPOLOGY.—Topological properties of Euclidean spaces, set-theoretic and combinatorial methods. Prerequisite: Mathematics 64 for 271; and 271 for 272. 6 s.h. (w) HINRICHS

283. PROBABILITY FOR ENGINEERS.—Basic probability concepts, the sample space, discrete and continuous events, permutations and combinations, conditional and marginal probability, discrete and continuous distributions, estimation, hypothesis testing, confidence intervals, multiple regression, one-way analysis of variance. Prerequisite: Mathematics 64. 3 s.h. (w) BURDICK

285. APPLIED MATHEMATICAL METHODS I.—Vectors, line and surface integrals, tensors, complex variables, differential and integral equations. Prerequisite: Mathematics 64. 3 s.h. (w) DRESSEL

286. APPLIED MATHEMATICAL METHODS II.—Wave equation, Fourier series, heat equation, telegraphic equations, Legendre polynomials, Bessel functions, Schrödinger's equation. Prerequisite: Mathematics 64. 3 s.h. (w) DRESSEL

287, 288. FOUNDATIONS OF MATHEMATICS.—Propositional calculus, predicate calculus, axiomatized number theory. Gödel completeness and incompleteness

theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 64, or consent of instructor for 287; and 287 for 288. 6 s.h. (w) Shoenfield

290. APPLICATIONS OF STOCHASTIC PROCESSES.—Recurrent events, random walk, Markov chains and processes, queueing theory, branching and diffusion processes, Gaussian processes. Prerequisite: Mathematics 136 or 283. 3 s.h. Williams

291, 292. THEORY OF FUNCTIONS.—Limits, implicit functions, power series, double series, Cauchy's theorem and its applications, residues, Riemann surfaces, conformal mapping. Prerequisite: Mathematics 64 for 291; and 291 for 292. 6 s.h. (w) Stackelberg

DEPARTMENTAL MAJOR

For the A.B. degree:

Prerequisite: Mathematics 21, 22

Major and Related Work: 42 semester hours.

Major Requirements: Mathematics 63, 64 and 18 semester hours in courses in mathematics numbered above 100.

Related Work: 18-24 semester hours of course work from the following departments: chemistry, economics and business administration, philosophy, physics. Two courses above the introductory level must be taken in at least one of these departments.

For the B.S. degree:

Prerequisite: Mathematics 21, 22.

Major and Related Work: 48 semester hours.

Major Requirements: Mathematics 63, 64 and 18 semester hours in courses in mathematics numbered above 100.

Related Work: 14-24 semester hours of course work in the natural sciences. Two courses above the introductory level must be taken in at least one of these departments.

The Department offers work leading to graduation with distinction. See the section on Honors in this *Bulletin*.

MEDICAL SCIENCE

This course in medical science has been approved by the Faculty Council as appropriate for the Bachelor's degree.

M201. ANATOMY AS RELATED TO LOCOMOTION.—The part of the body concerned with locomotion and posture will be dissected completely, whereas the thoracic, abdominal and pelvic organs, and the deeper structures of the head will be taught by means of audio-visual aids and prosections. September to January. Prerequisites: One year each of biology, chemistry, and physics. 6 s.h.

Markee and Everett; Becker and Duke

MUSIC

PROFESSOR BONE, CHAIRMAN; PROFESSOR MUELLER, DIRECTOR OF UNDERGRADUATE STUDIES; VISITING PROFESSOR HAMILTON; ASSOCIATE PROFESSORS BRYAN, HANKS, KLENZ, SAVILLE AND WITHERS; ASSISTANT PROFESSOR HENDRIX; VISITING ARTIST CIOMPI; INSTRUCTORS FISHBAUGH, FRIEDBERG AND HENRY; MMES. CUSHMAN, MCCALL AND PHELPS

Courses in music are offered both for the general student who wishes to acquire knowledge of music as literature and, on a more technical level, for those prepared to major in the field. The courses marked * are open to general students without prerequisite.

THEORY AND COMPOSITION

65-66. MUSIC THEORY I. *Harmony and Theory of Music.*—Manipulation and analysis of melodic, harmonic, rhythmic, contrapuntal and formal principles of

tonal organization through written exercises, ear training, sightsinging and keyboard harmony. Three lectures, two laboratory hours throughout the year. 8 s.h. (E) BRYAN, FISHBAUGH, AND FRIEDBERG

115-116. MUSIC THEORY II. *Advanced Harmony and Counterpoint.*—First semester, exercises in advanced harmonic techniques and studies in formal analysis; second semester, emphasis on contrapuntal techniques and writing in the smaller forms. Prerequisite: Music 65-66. Two lectures; two laboratory hours throughout the year. 6 s.h. (E) KLENZ AND FISHBAUGH

117, 118. MUSIC THEORY III. *Composition and Analysis.*—The development of technical and expressive means in various media and styles through practical exercises in composition and analysis of larger forms. The completion of an original work in an instrumental or choral medium. Prerequisite: Music 115-116 or consent of the instructor. 4 s.h. (F) HAMILTON

121. CONDUCTING.—The conducting of orchestral and vocal scores. Score-reading and analysis, principles of interpretation, establishment of vocal and instrumental conductoral techniques leading to practical experience in conducting the department musical organizations in rehearsal. Prerequisites: Music 65-66, 115-116 or consent of the instructor. 3 s.h. (E) BONE

122. ORCHESTRATION.—A study of the technical characteristics and transpositions of the instruments of the modern symphony orchestra and concert band. Instrumentation of piano scores of original compositions for string, woodwind, brass ensembles, and for full symphony orchestra or concert band. Prerequisites: Music 65-66, 115-116 or consent of the instructor. 3 s.h. (E) BONE

HISTORY AND LITERATURE

*1-2. INTRODUCTION TO MUSIC LITERATURE.—Rhythm, melody, harmony, form, instruments of the orchestra as principal elements of an effective listening technique. Selected works representing major composers of the Baroque, Classic, Romantic, and Contemporary periods are approached through the several performance media of song, orchestra, piano, chamber music, opera. Open only to freshmen; others, see Music 51-52 and 51X-52X. 6 s.h. (F) HENRY

*51-52. INTRODUCTION TO MUSIC LITERATURE.—The aims of this course are identical with those of Music 1-2; the content and method are adapted to the capacities of upperclassmen. Open only to upperclassmen who have not completed Music 1-2. 6 s.h. (E) STAFF

*51X-52X. INTRODUCTION TO MUSIC LITERATURE.—A special section for music majors and advanced general students. A historical, stylistic survey of music literature from 1600 to the present. 6 s.h. (E) MUELLER

*125. MASTERWORKS OF MUSIC LITERATURE.—An intensive study of selected masterworks which represent the principal currents in modern music history. Compositions by Bach, Mozart, Beethoven, Brahms, Debussy and Bartok will constitute a frame of reference for historical, biographical and stylistic analysis. 3 s.h. (E) HAMILTON AND MUELLER

*134. CHORAL LITERATURE.—A study of great choral works from the Renaissance to the present. The development of the mass, motet, cantata, oratorio, and passion, with attention to changing aesthetic and religious concepts as well as to formal and stylistic means. Intensive study of complete scores of composers selected from palestrina to Stravinsky; individual projects. 3 s.h. (F) SAVILLE
Not offered 1965-66.

135. PIANO LITERATURE.—A survey of the great works for keyboard instruments, from the time of the English virginal composers to the present. Prerequisites: Music 47A, 48A, 97A, and 98A, or consent of the instructor. 3 s.h. (E) WITHERS

136. SOLO SONG LITERATURE.—A study of selected standard repertoire: early Italian and English songs, German lieder; the French, English and American art song and the standard operatic aria. Open to voice students and others by consent of the instructor. 3 s.h. (E) HANKS

139. TWENTIETH CENTURY MUSIC.—The course will trace the most influential creative stylistic developments in music of the present century. A critical survey will emphasize works by key figures Bartok, Berg, Schonberg, and Stravinsky as a means of establishing a relative standard of values for subsequent independent exploration. Prerequisite: A one-year course in Music Theory or Literature, or consent of the instructor. 3 s.h. (E) HAMILTON

147-148. HISTORY OF MUSIC.—The history of the development of music as a manifestation of Western culture from mediaeval to modern times. The rise of Christianity through the Renaissance, first semester; the Baroque to the present, second semester. Prerequisite: A one-year course in Music Theory or Literature, or consent of the instructor. 6 s.h. (E) SAVILLE AND KLENZ

149. ORGAN LITERATURE.—A survey of the great works for organ from Bach to the present day. Interpretive analysis illustrated through performance whenever practicable. Attention will be given to problems of registration and style relating to the technical capacities of organ construction in each period studied. Emphasis on J. S. Bach, 19th century French and contemporary organ works. Open to organ students and others by consent of the instructor. 3 s.h. (W) HENDRIX

*163. MUSIC IN THE EIGHTEENTH CENTURY.—The development of important instrumental and vocal media and formal concepts through study of the music, the musicians and their environment. 3 s.h. (F) BRYAN

*164. MUSIC IN THE NINETEENTH CENTURY.—A study of the music of the nineteenth century, from Beethoven to Debussy, with attention to artistic and literary influences, and the relations among the creative minds of the time. Individual projects. 3 s.h. (E) MUELLER

*165. OPERA LITERATURE.—A study of opera from the Florentine Camerata to the present. The development of the operatic idea, with attention to changing relationships of music and text, to opera as social commentary, as well as to formal and stylistic means. Intensive study of complete scores of composers selected from Monteverde to Bartok; individual projects. 3 s.h. (E) SAVILLE

INDEPENDENT STUDY AND SENIOR SEMINAR

Admission to these courses will be subject to approval of the Director of Undergraduate Studies of the Department of Music and the individual instructor. The instructor as well as the course content will be established in accordance with the individual student's interests and capacities.

The Department offers work leading to graduation with distinction. See the section on Academic Honors on page 36.

191, 192. INDEPENDENT STUDY.—Directed reading and research and musical analysis within a prescribed area of musical literature. Open only to highly qualified students in the junior year, by permission of the department. See page 38. 6 s.h. (E) STAFF

193, 194. INDEPENDENT STUDY.—Same as 191, 192 but for seniors. See page 38. 6-12 s.h. (E) STAFF

195. CORRELATING INDEPENDENT STUDY.—Correlated study in the humanities, cultural epochs in European civilization or church history and liturgy is suggested. An extended paper is required. Intended primarily for senior music majors, but other qualified students may be admitted. 3 s.h. (E) KLENZ

197, 198. SENIOR SEMINAR IN MUSIC.—Offers guidance in the sources and materials of musical literature, and in the methods of stylistic analysis and criticism. A background of historical, stylistic, and theoretical knowledge is essential. Formal papers will be required. Open only to seniors, but not restricted to candidates for degree with distinction. 6 s.h. (E) STAFF

MUSIC EDUCATION

57-58. VOCAL DICTION.—Problems of diction as specifically applied to the art of singing. Required of all Applied Voice Majors. 2 s.h. (E) HANKS

106. PIANO METHODS AND MATERIALS.—A study of the materials and methods of piano pedagogy. The appropriate choice of essential and supplemen-

tary literature. Development of technique, style, and musicianship. Supervised practice teaching. Prerequisite: Music 47A, 48A, 97A, and 98A, or consent of the instructor. 3 s.h. (E) WITHERS

151. PUBLIC SCHOOL MUSIC EDUCATION.—Development of the child through music. Child voice and song literature; rhythmic activities; learning to listen; use of elementary instruments such as the autoharp, psaltery, bells, rhythm band instruments. Both group and individual help in elementary music theory; music reading exercises; chording and improvising piano accompaniments; conducting; construction of rhythm band scores. Integration of music with other activities, such as planning music for social studies units. 3 s.h. (E) MCCALL

152. PUBLIC SCHOOL MUSIC LITERATURE.—A study and analysis of key works in the symphonic, pianistic, and vocal repertoire which are particularly applicable to the teaching of music appreciation as a cultural aspect of social studies in the public school. 3 s.h. (E) MCCALL

153. VOCAL MUSIC IN THE PUBLIC SCHOOL.—Aims, repertoire, and techniques for teaching vocal music in the junior and senior high schools. Emphasis on organizations, administration, training, and performance of school choirs and ensembles; care of the changing voice. Planning a good music curriculum. 3 s.h. (E) SAVILLE

154. INSTRUMENTAL MUSIC IN THE PUBLIC SCHOOL.—Materials and methods of teaching instrumental music in the junior and senior high schools; emphasis on teaching technics, repertoire, organization, and administration of the instrumental curriculum. 3 s.h. (E) BONE

APPLIED MUSIC

The study of Applied Music concerns the understanding of music literature through performance. Instruction is offered in the following media: A. Piano; B. Strings; C. Woodwinds; D. Brass; E. Voice; F. Ensemble—Instrumental, Piano, Vocal coaching and performance; participation through one of the Departmental Ensembles listed at close of the Music section; G. Organ. Instruction in media A through E may be private or in classes limited to a minimum of 4 and a maximum of 7 students. Class instruction is restricted to the first 4 grades of proficiency. Class instruction shall be designated by adding the letter X to the appropriate medium and year-in-school classification. (Example: junior year, Woodwinds, class instruction is recorded 147CX.)

Students must contact the Music Department office so as to arrange an audition with the appropriate instructor *prior to registration in Applied Music courses.* The course numbers listed below refer to the student's class standing and not his musical proficiency.

47A, 48A; 97A, 98A; 147A, 148A; 197A, 198A. PIANO.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (F) WITHERS, FISHBAUGH AND PHELPS

47B, 48B; 97B, 98B; 147B, 148B; 197B, 198B. VIOLIN, VIOLA, 'CELLO.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) CIOMPI AND KLENZ

47C, 48C; 97C, 98C; 147C, 148C; 197C, 198C. WOODWINDS.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) HENRY

47D, 48D; 97D, 98D; 147D, 148D; 197D, 198D. BRASS.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) BRYAN

47E, 48E; 97E, 98E; 147E, 148E; 197E, 198E. VOICE.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) HANKS AND CUSHMAN

47F, 48F; 97F, 98F; 147F, 148F; 197F, 198F. ENSEMBLE.—For freshmen, sophomores, juniors, seniors. 1 s.h. (E) STAFF

47G, 48G; 97G, 98G; 147G, 148G; 197G, 198G. ORGAN.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) HENDRIX

Credits: Credit for instruction in media A, B, C, D, E, and G is granted on the basis of 2 s.h. per semester for *one hour* of private instruction per week and a minimum of six hours practice weekly; or 1 s.h. per semester for *one-half hour* of private instruction, or one period of class study, and a minimum of six hours

practice per week. An additional weekly class meeting for performance and criticism may be required by the instructor without additional credit.

Credit for instruction in medium F is granted on the basis of 1 s.h. per semester for one rehearsal period of instruction and a minimum of three hours practice per week.

Music majors shall plan their Applied Music study so as to meet the following requirements of their chosen areas of concentration:

Majors in Music Theory or Music History and Literature should earn a minimum of 6 s.h. credit in Applied Music.

Majors in Applied Music must register for one hour of private instruction *per semester* and may earn a maximum of 18 s.h. credit in Applied Music.

Majors in Music Education who expect to teach music in the public schools should plan their Applied Music programs in consultation with the Director of Undergraduate Studies in Music. The credit hours in Applied Music required for certification in North Carolina may be earned through a program which includes the study of a major medium, a minor medium and participation in departmental organizations. (See p. 43 of this *Bulletin*).

Students other than music majors may receive not more than 8 s.h. credit for work in Applied Music. They may elect, after consultation with the Department either 1 hour (2 s.h. credit) or ½ hour (1 s.h. credit) of private instruction per semester. *No credit in Applied Music* will be allowed unless the student satisfactorily completes at some time before graduation six semester hours in Music Theory, or Music History and Literature.

FEES: Upper class students who have been accepted as music majors at the time of registration for applied music courses are exempt from paying the applied music fees. Other students are charged for all applied music media except "F" (Ensemble).

Fees are payable to the Treasurer's office of Duke University upon notification from that office at the beginning of each semester as follows:

One ½ hour private lesson per week for one semester	$45.00
Two ½ hour private lessons per week or one 1-hour private lesson per week for one semester	80.00
One 1-hour class lesson per week for one semester	20.00

All students registered for applied music instruction are charged for practice room facilities as follows:

Medium A. Piano Medium E. Voice Medium G. Organ	$15.00 per semester (room with piano or organ)
Medium B. Strings Medium C. Woodwinds Medium D. Brass	$10.00 per semester (room without piano)
Medium F. Ensemble	No practice room fee is charged

DEPARTMENTAL MAJOR

Prerequisites: Music 51-52 and 65-66.

Major Requirements: A minimum of 24 s.h. beyond the prerequisite courses. Initial work in the Department includes the following required courses:

Freshman Year:	Music 65-66
Sophomore Year:	Music 51-52, Music 115-116
Junior Year:	Music 147-148

During Orientation Week all prospective entering Freshman Music Majors are required to take: A. Piano proficiency exam., B. Theory proficiency exam., C. Audition in their major performance medium.

AREAS OF UPPERCLASS SPECIALIZATION

Concentration in one of four major areas in Music is possible in the Junior and Senior years. While the following outlines include more than the number of hours *required* for a major in music, they are strongly recommended by the Department as a basis for effective study.

Theory and Composition

Required:
Music 117-118, 122; Applied Music: 6 s.h.

Additional Departmental Recommendations:
Music Electives: 6 s.h.

History and Literature

Required:
2 Elective Courses in Music Literature; plus Music 197, 198;
Applied Music: 2 s.h.

Additional Departmental Recommendations:
Music Electives: 10 s.h., including a minimum of 4 s.h. in Applied Music.

Applied Music—A program of study designed for those students who intend to become performers and teachers of applied music.

Required:
Applied Music: 12 s.h.

Additional Departmental Recommendations:
Applied Music: 6 s.h.

Piano or Organ:
Music 135 or 149; 106 (Piano Majors only)

Voice:
Music 136; 57-58.

Other Media:
Study sequence to be worked out in consultation with the Director of Undergraduate Studies.

Music Education—A program of study designed for prospective teachers of High School Instrumental or Vocal Music. Details of this program are shown on page 43 of this *Bulletin*.

The music major must participate in one of the Departmental Ensembles or Organizations during *each* semester of undergraduate study.

DEPARTMENTAL ENSEMBLES

Brass Ensemble
Chamber Orchestra
Madrigal Singers
Piano Ensemble (may be in combination with Instruments or Voice)
String Ensemble (Sonata, Trio or Quartet)
Vocal Ensemble (Opera Workshop)
Woodwind Quintet

DEPARTMENTAL ORGANIZATION

Duke University Concert Band
Duke University Symphony Orchestra

NAVAL SCIENCE

PROFESSOR CALDWELL, CAPTAIN, U. S. NAVY, CHAIRMAN; ASSOCIATE PROFESSOR LE TOURNEAU, COMMANDER, U. S. NAVY, DIRECTOR UNDERGRADUATE STUDIES; ASSISTANT PROFESSORS: TWOMEY, MAJOR U. S. MARINE CORPS; GOBEN, LIEUTENANT COMMANDER, U. S. NAVY; STUTZ, LIEUTENANT, U. S. NAVY; CRACKNELL, LIEUTENANT, U. S. NAVY; JONES, LIEUTENANT, U. S. NAVY

Standardized titles and numbers for courses are established by the Bureau of Naval Personnel for use at the 52 NROTC institutions. The first digit indicates

the year of the course; the second digit (0) indicates that it is given on a semester basis; the third digit indicates the semester of the school year in which offered. Specialized courses for Marine Corps Officer candidates are indicated by the letter "M" after the number, and substitute for the basic course of the same number.

NS 101. NAVAL ORIENTATION.—History of navy regulations, naval customs and courtesies which are basic to further study of Naval Science. Introduction to carrier, air, surface, undersea, and amphibious warfare; basic types, characteristics, capabilities, and limitations of naval vessels; deck seamanship; naval formations and maneuvers. 3 s.h. (w) LE TOURNEAU AND CRACKNELL

NS 102. NAVAL HISTORY.—Naval history relating the rise and fall of sea power to other aspects of world history as a basis for understanding the role of navies in the world today. 3 s.h. (w) LE TOURNEAU AND CRACKNELL

91. INTRODUCTORY PSYCHOLOGY.—See page 115 of this *Bulletin* for course description. This is a University course required for all NROTC midshipmen.

NS 201. NAVAL WEAPONS.—A survey of the fundamentals of naval weapons and systems including the gun-weapon delivery problem, anti-submarine warfare, missiles, nuclear weapons, and space technology and their application to the control of the seas. 3 s.h. (w) JONES

NS 301. NAVIGATION.—Magnetic and gyro compasses; principles of chart construction; dead reckoning; piloting, nautical astronomy including a study of the actual and apparent motion of the earth, celestial coordinates, times systems, the astronomical triangle, identification of stars and planets; solutions of observations for lines of position; and work in practical navigation. 3 s.h. (w) STUTZ

NS 302. NAVAL OPERATIONS.—A survey of the components of general naval operations including concepts and application of relative motion, collision prevention, communications, weather, and the command and delegated functions involved in maneuvering single ships and multiship formations. 3 s.h. (w) STUTZ

NS 401. NAVAL ENGINEERING.—Principles of steam engineering as related to naval power plants for main propulsion and auxiliary machinery; principles of the marine nuclear engineering propulsion system; principles of ship stability and damage control; a general understanding of internal combustion engines. 3 s.h. (w) GOBEN

NS 402. PRINCIPLES AND PROBLEMS OF LEADERSHIP.—A study of the principles and problems of effective leadership with emphasis on the role of the military leader. Leadership precepts of personal example, sound management practice, and moral responsibility; human relations; discipline and administration of military justice are included. 3 s.h. (w) GOBEN

NS 301M. EVALUATION OF THE ART OF WAR.—A survey of the evolution of weapons, strategy, tactics and material; illustration of the classic principles of war by a study of selected battles and campaigns; a summary of the development of U. S. military and foreign policy. 3 s.h. (w) TWOMEY

NS 302M. MODERN BASIC STRATEGY AND TACTICS.—Modern tactical principles and techniques, especially on the small unit level, illustrated by contemporary historical examples; development of a general understanding of strategy. 3 s.h. (w) TWOMEY

NURSING

The nursing program is published separately in the *Bulletin of the School of Nursing*. (See inside of front cover.)

PHILOSOPHY

PROFESSOR BAYLIS, CHAIRMAN; ASSOCIATE PROFESSOR WILSON, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSOR BINKLEY, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS CLARK, NEGLEY, PEACH, AND WELSH; ASSISTANT PROFESSOR SPECTOR

The undergraduate program in the Department of philosophy is designed to acquaint students with the content and the structure of philosophical theory in various areas. Discussion is encouraged so that the student can engage actively in the philosophical examination of problems.

Course offerings fall into two general categories: the systematic and the historical. In a systematic treatment, the organization of a course is primarily in terms of the problems presented by the subject-matter of that course, as in logic, ethics, metaphysics, etc. In historical courses, attention is directed more to the order of development in the thought of a particular philosopher (Plato, Aristotle, Kant, etc.), or in a historical period. In all courses, reading of the works of philosophers will acquaint the students with the important and influential contributions to the definition and solution of philosophical issues.

The problems raised in philosophy in respect to the various field of the arts and sciences involve questions which are not normally given attention in those particular disciplines. In the consideration of such problems, therefore, it is expected that the student will acquire some understanding and perspective of the major areas of man's intellectual endeavor. In this sense, philosophical comprehension is an essential part of a student's learning and education.

41, 42. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include, in Philosophy 41, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. In Philosophy 42 these include the nature and ground of values, ultimate goals, and moral obligation. (Philosophy 42 may be taken before, or with, Philosophy 41.) 6 s.h. STAFF

48. LOGIC.—A study of the conditions of effective thinking and clear communication. Examination of the basic principles of *deductive* reasoning. Open to freshmen and sophomores only. 3 s.h. BINKLEY, CLARK, AND WELSH

93, 94. HISTORY OF PHILOSOPHY: ANCIENT AND MODERN.—An introduction to philosophy through the study of some of the major writings of the ancient Greek philosophers (93) and modern philosophers through Kant (94). 6 s.h. (E) (Open to freshmen with a *B* average.) PEACH AND WILSON

101. PHILOSOPHY OF RELIGION.—A philosophical examination of selected concepts and doctrines of religion. 3 s.h. (E) BINKLEY

103. SYMBOLIC LOGIC.—Detailed analysis of deduction and of deductive systems. Open to sophomores only by permission of instructor. 3 s.h. (E) CLARK AND WILSON

104. PHILOSOPHY OF SCIENCE.—The principal philosophical and methodological problems in contemporary science. 3 s.h. (E) SPECTOR

107. POLITICAL AND SOCIAL PHILOSOPHY.—Discussion of the fundamental principles of political and social organizations, with particular attention to democratic philosophy, corporate theory, and Marxist-Soviet philosophy. 3 s.h. (W) NEGLEY

108. SOCIAL IDEALS AND UTOPIAS.—Reading of selected Utopias; analysis of the value-structures and political principles of these ideal societies. 3 s.h. (W) NEGLEY

109. PHILOSOPHY OF LANGUAGE.—A philosophical analysis of problems arising in the study of language and symbolism. Topics include: the nature of language, sign-using behavior, theories of meaning, types of discourse (scientific, mathematical, poetic), definition, ambiguity, metaphor. 3 s.h. (E) WELSH

110. EPISTEMOLOGY.—A treatment of the problems of truth and knowledge; of *a priori* and empirical statements; and of theories of perception and probability. 3 s.h. (E) BAYLIS, BINKLEY

111. METAPHYSICS.—A consideration of a selection from the following: Hegelian essentialism and existentialist reaction; traditional treatments of the mind-body problem: dualism, phenomenalism and materialism; rival theories of causation, space and time. 3 s.h. (E) BAYLIS, BINKLEY, AND WILSON

117. ANCIENT AND MODERN ETHICAL THEORIES.—The development of ethical thought in the West; the interaction between culture and ethical theory, with special reference to the Greek city-state, Roman law, the Renaissance, the Reformation, and the rise of modern science. Readings in the great ethical philosophers. 3 s.h. (E) WELSH

FOR SENIORS AND GRADUATES

202. AESTHETICS: THE PHILOSOPHY OF CRITICISM.—A study of some fundamental issues in aesthetics with particular reference to the fields of literature, music and painting. Problems discussed include the role of standards in criticism, aesthetic judgment, interpretation and evaluation in the arts, meaning in the arts, art and truth, the arts and morality. Open to juniors with the approval of the instructor. 3 s.h. WELSH

203. CONTEMPORARY ETHICAL THEORIES.—Study of the nature and justification of basic ethical concepts in the light of the chief ethical theories of twentieth century British and American philosophers. 3 s.h. BAYLIS AND BINKLEY

205. THE PHILOSOPHY OF HISTORY.—Discussion of the method, metaphysical implications, and influence of interpretations of history; Hegel, Marx, Spengler, Toynbee. 3 s.h. (W) NEGLEY

208. POLITICAL VALUES.—Analysis of the systematic justification of political principles and the political values in the administration of law. 3 s.h. (W) NEGLEY

211. PLATO.—A critical study of the dialogues with special emphasis on problems in ethics, epistemology, and metaphysics. 3 s.h. (E) BINKLEY

217. ARISTOTLE.—A study of parts of the *Organon, Physics, De Anima,* and *Metaphysics.* 3 s.h. (E) WILSON

219. KANT.—Reading and discussion of his philosophy, with some attention to historical continuity. 3 s.h. (W) NEGLEY

225. BRITISH EMPIRICISM.—A critical study of the writings of Locke, Berkeley, or Hume, with special emphasis on problems in the theory of knowledge. 3 s.h. (E) PEACH

227. CONTINENTAL RATIONALISM.—A critical study of the writings of Descartes, Spinoza, or Leibniz, with special emphasis on problems in the theory of knowledge and metaphysics. 3 s.h. (E) PEACH

228. RECENT AND CONTEMPORARY PHILOSOPHY.—A critical study of some contemporary movements in philosophy with special emphasis on the work of Moore, Russell, Wittgenstein, Wisdom, and Ryle. 3 s.h. (E) WELSH

229. AMERICAN PRAGMATISM.—Studies in the philosophy of Pierce, James, Dewey, and Mead. 3 s.h. (E) WELSH

233. INTRODUCTION TO THE PHILOSOPHY OF SCIENCE.—A systematic study of some central problems in the methodology of the sciences, e.g., the concept of a scientific explanation, theory and observation, and other topics. SPECTOR

234. PHILOSOPHY OF SCIENCE.—Selected problems in the physical and non-physical sciences. Topics such as space, time, measurement, probability and induction, and problems in the philosophy of the behavioral and social sciences. Prerequisite: Philosophy 233. SPECTOR

235. PHILOSOPHY AND THE SCIENCES.—An introduction to the philosophy of science with emphasis on the writings of philosophers and scientists in the history of science, such as Galileo, Newton, Mach, Poincare, and Einstein. (1964-65) SPECTOR

236. SPECIAL PROBLEMS IN THE PHILOSOPHY OF SCIENCE.—Selected topics concerning the methods of the sciences and the philosophy of science. (1964-65) Prerequisite: Previous work in the philosophy of science, or consent of the instructor. SPECTOR

The four courses above are given normally in a two year cycle.

241. LOGIC.—Fundamental problems of logic. 3 s.h. (E) CLARK AND WILSON

246. GENERAL SEMANTICS AND THEORY OF LANGUAGE.—An examination of semantical theory through Frege, Russell, Church, Tarski, Carnap, and Quine, together with a consideration of the implications of meaning theory for general philosophy. 3 s.h. (E) WILSON

250. PHILOSOPHICAL ANALYSIS.—A critical study of recent and contemporary essays in philosophical analysis, and an evaluation of the nature, methods, and results on this movement. 3 s.h. (E) BAYLIS, CLARK, AND WILSON

252. METAPHYSICS.—A critical and evaluative study of rival metaphysical theories and their bases. Analysis of the fundamental metaphysical categories and of metaphysical methods. 3 s.h. (E) BAYLIS, CLARK, AND WILSON

291, 292. CRITICAL PHILOSOPHY.—The analysis of basic philosophical concepts and beliefs with a view to critical evaluation and constructive emendation of them. Emphasis on the practice as well as the principles of philosophical criticism and problem solving. 3 s.h. each. Enrollment only by permission of the department. 291 is ordinarily prerequisite for 292. (E) THE GRADUATE STAFF

DEPARTMENTAL MAJOR

Philosophy 48 (Logic) is recommended for all those intending to major in philosophy. Philosophy 41, 42 is ordinarily a prerequisite to major work.

Major requirements: 24 semester hours in philosophy of which at least eighteen must be in courses numbered above 48. The following must be included:

Philosophy 93, and 94.
Philosophy 117, or 203, or 208.
6 semester hours in Philosophy senior-graduate courses.

Related Work: Six hours minimum in each of two departments approved by the philosophy adviser. Courses may not be those primarily open to freshmen. There is no restriction in principle as to departments in which related work may be taken, and the approval of the Philosophy adviser is required only to insure some coherence in the program of major and related work as a whole.

The Department offers work leading to graduation with distinction. See the section on Honors.

PHYSICS

PROFESSOR FAIRBANK, CHAIRMAN; PROFESSOR MEYER, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR CARPENTER, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS BIEDENHARN, FOWLER, GORDY, GREULING, LEWIS, NEWSOM, NIELSEN AND SPONER; ASSOCIATE PROFESSOR ROBINSON; ASSISTANT PROFESSORS BILPUCH, EVANS, FORTNEY, MIYAQAWA, ONLEY, ROBERSON, TILLEY, AND WALTER; LECTURER BARTON; INSTRUCTORS GUYER, HUNT, RICHARDSON, AND WINNEWISSER

1-2. INTRODUCTORY PHYSICS.—This course traces historically and experimentally the development of the important principles of physics. This course is open to freshmen, sophomores and juniors and meets the general science requirement. Three lectures and one two-hour laboratory each week. 8 s.h. (W) CARPENTER, NIELSEN, BARTON, AND ASSISTANTS

41-42. GENERAL PHYSICS.—This course treats the basic principles of general physics in a more quantitative manner than Physics 1-2. It meets in a thorough way the physics requirement for entrance into the study of either medicine or engineering, and is well suited for the general science student. This course is not open for credit for students who have completed Physics 1-2. Three lecture-recitations and one three-hour laboratory period each week. Prerequisites: Mathematics 21, 22 or equivalent (Mathematics 21, 22 may be taken concurrently). 8 s.h. (W) CARPENTER, LEWIS, FAIRBANK, GREULING, ONLEY, FORTNEY, RICHARDSON, EVANS, WALTER, AND ASSISTANTS

125. INTERMEDIATE PHYSICS—MECHANICS.—The course covers in a thorough manner the elements of mechanics. Three recitations per week. Prerequi-

sites: Physics 1-2 or 41-42 or equivalent, and a course in differential and integral calculus. Mathematics 22 may be taken concurrently. 3 s.h. (w) TILLEY

126. INTERMEDIATE PHYSICS—ELECTRICITY.—The elements of electricity and magnetism. Three lectures and one three-hour laboratory per week. Prerequisites: Physics 125 or equivalent work approved by the instructor and differential and integral calculus. 4 s.h. (w) TILLEY

161, 162. MODERN PHYSICS.—Review of electromagnetic fields, relativity, quantum phenomena, atomic and molecular spectra, solids, and nuclear physics. Three lectures each week. Prerequisites: Physics 41-42, Mathematics 22. 161 is prerequisite for 162. 6 s.h. (w) ROBERSON

171. ELECTRONICS.—A.C. circuits, transients, fundamentals of vacuum tubes and electron physics, basic electronic circuits. Three lectures and one three-hour laboratory each week. Prerequisite: Physics 126 or equivalent work approved by the instructor. 4 s.h. (w) HUNT

176. INTERMEDIATE PHYSICS—THERMODYNAMICS AND KINETIC THEORY.—The elements of thermodynamics, kinetic theory and elementary statistical mechanics. Three lectures per week. Prerequisites: Physics 125 or equivalent work approved by the instructor, and differential and integral calculus. 3 s.h. (w) MEYER

A course in general college physics, Physics 125 and 126 or equivalent validated by examination, and a course in differential and integral calculus are prerequisites to all courses numbered 200 and above.

201, 202. MECHANICS.—The fundamental principles of Newtonian mechanics; general dynamics of systems of particles and rigid bodies; the methods of LaGrange and Hamilton; generalized mechanics. 6 s.h. GREULING

213, 214. CONTEMPORARY PHYSICS.—A course which covers the fundamental concepts and the experimental basis of modern physics. Three lectures each week. 6 s.h. (w) WALTER

217, 218. ADVANCED PHYSICS LABORATORY.—Measurements involving the fields of mechanics, electricity magnetism, heat, optics and modern physics. 6 s.h. (w) MEYER

220. ADVANCED ELECTRONICS.—Vacuum tubes and solid state devices, advanced circuit analysis. Three lectures and one three-hour laboratory each week. 4 s.h. (w) HUNT

221, 222. THEORETICAL PHYSICS.—Mechanics of particles and of rigid bodies, elasticity, fluids dynamics, electrodynamics; optic, relativity thermodynamics, statistical mechanics, wave mechanics. Prerequisite: Mathematics 285-286 or equivalent to be taken at least concurrently. 6 s.h. (w) WINNEWISSER

223. ELECTRICITY AND MAGNETISM.—Electrostatics, magnetostatics and potential theory; dielectric and magnetic media; magnetic field of currents and law of induction. 3 s.h. (w) ROBINSON

224. ELECTRICITY AND MAGNETISM.—Maxwell's electrodynamics, theory of wave optics, refraction, interference and diffraction. Prerequisite: Physics 223, 3 s.h. (w) ROBINSON

225, 226. ELEMENTARY INVESTIGATIONS.—The aim of this course is to provide training in the laboratory and library methods of physical research. Properly qualified students may conduct elementary investigations under the supervision of a member of the staff. 3-6 s.h. (w) THE STAFF

DEPARTMENTAL MAJOR

A student wishing to major in physics should arrange to complete the necessary mathematics as soon as possible.

A. for the A.B. degree:

Prerequisites: Physics 1-2 or 41-42 or equivalent, and Mathematics 21, 22.

Major Requirements: At least 18 semester hours in physics including Physics 125, 126, 171 and 176 or equivalent 217 or 218.

Related Work: Eighteen to 24 semester hours from the following courses:

Mathematics 21, 22, 63, 64 and 131, and Chemistry 1-2.

B. for the B.S. degree:

Prerequisites: Physics 1-2 or 41-42 or equivalent, and Mathematics 21, 22 or equivalent.

Major Requirements: Physics 125, 126, 171, and 176 or equivalent, 213, 214, 217, 218 and either 201 or 223.

Related Work: Fourteen to 24 semester hours from the following courses: Mathematics 21, 22, 63, 64 and 131. and Chemistry 1, 2 or 1 and 42.

The Department offers work leading to graduation with distinction. See the section on Honors.

POLITICAL SCIENCE

PROFESSOR HALLOWELL, CHAIRMAN; ASSOCIATE PROFESSOR HALL, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BALL, BRAIBANTI, COLE, CONNERY, KULSKI, RANKIN, AND WILSON; VISITING PROFESSOR KLINE; ASSOCIATE PROFESSORS LEACH, PROCTOR, SIMPSON AND SINDLER; VISITING ASSOCIATE PROFESSOR SAYEED; ASSISTANT PROFESSORS CHEEK, FINLAY, HOWARD AND KEARNEY; VISITING ASSISTANT PROFESSOR HULL; INSTRUCTOR ZIKMUND; MESSRS. MEEKISON AND WASHBURN

The objective of the Department of Political Science is to acquaint students with the theory and practice of government and politics at the local, state, national and international levels. While primary attention is focused upon the American political and administrative system, emphasis is also placed upon a comparative study of the political institutions and movements of thought peculiar to the nations of Europe, Latin America, Africa and Southern Asia. The student's attention is also directed to the problems encountered in international organization, politics and law. The development of political philosophy from Plato to the present day is an essential part of the department's course offerings. Methods of study include the descriptive, the historical, the legal, the comparative and the philosophical.

Directing its effort to an intelligent understanding of the contemporary world and of the responsibilities which are laid upon citizens of a democracy, the Department of Political Science shares the objectives of a liberal arts education. While the department does not aim at vocational education, the knowledge it seeks to impart should be useful to anyone contemplating a career in the government service or politics.

Students intending to major in the department should take Political Science 11-12 or 61-62. Ordinarily one of them must be taken before proceeding to more advanced work in the department. This rule may be waived with the consent of the Director of Undergraduate Studies.

The advanced courses are divided into three major groups but no sequence of courses beyond the introductory course is prescribed. The student would be well advised, however, to select some courses from each group.

The Senior Seminar is designed to provide an opportunity for majors in the department to pursue independent study and research, and to qualify for graduation with distinction.

INTRODUCTORY COURSES

11-12. AMERICAN AND EUROPEAN POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. An introductory course for freshmen dealing with the topics indicated in the description of Political Science 61-62. (Open only to Freshmen) 6 s.h. (E & W)

HALL; CHEEK AND FINLAY; MEEKISON AND ZIKMUND

61-62. AMERICAN AND EUROPEAN POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. The first semester is devoted to the study of American constitutional democracy. Topics examined include federal-state relations, the separation and interrelationships of the executive, legislative and judicial branches of government, judicial review, the role of political parties and public opinion, the formulation and execution of domestic and foreign

policy, civil liberties. The second semester is devoted to a study of constitutional democracy in Great Britain and France with emphasis upon the similarities and differences between those systems and our own. Detailed attention is also given to an examination of the theory and practice of totalitarian dictatorship as exemplified in the U.S.S.R. 6 s.h. (E & W) (Not open to Freshmen)
KLINE; LEACH AND SIMPSON; CHEEK AND KEARNEY; MEEKISON, WASHBURN AND ZIKMUND

POLITICAL THEORY AND COMPARATIVE GOVERNMENT

123. INTRODUCTION TO POLITICAL PHILOSOPHY.—A course devoted to the reading and discussion of selected political classics including Plato's *Republic,* Aristotle's *Ethics* and *Politics* and other works as time permits. 3 s.h. (W)
HALLOWELL

127. INTRODUCTION TO LAW.—An introduction to the nature and functions of law, with emphasis on the varied uses of law in ordering society, the process of legal growth and the nature of legal reasoning. Some attention will be given to basic issues of jurisprudence. 3 s.h. (W) Open only to Juniors and Seniors.
HOWARD

131. INTRODUCTION TO AMERICAN POLITICAL THOUGHT.—Basic elements in the American political tradition as developed from its English roots to the present. 3 s.h. (W) LEACH

136. MAJOR EUROPEAN GOVERNMENTS.—A general introductory survey of the governments of Great Britain, France, Germany, Italy, and the Soviet Union. Special attention is given to constitutional developments, the organization and ideologies of political parties, and current political problems. 3 s.h. (W) [Not open to students who have taken Political Science 12 or 62 but open to all others without prerequisite.] COLE

143. COMPARATIVE GOVERNMENT AND POLITICS: THE MIDDLE EAST.—Political institutions and behavior in the Arab states, Israel, Turkey and Iran. 3 s.h. (W) PROCTOR

151. COMPARATIVE GOVERNMENT AND POLITICS: LATIN AMERICA.—A study of politics and government in selected Latin American states, including Argentina, Brazil, Chile and Mexico. Political forces and their impact upon governmental institutions. 3 s.h. BALL

155. PROBLEMS OF POLITICAL DEVELOPMENT IN THE NEW STATES.—Survey of change and modernization in Africa and Asia; nationalism and neutralism, role of political parties, the military, and the bureaucracy in nation building; economic growth and foreign aid. 3 s.h. (W) BRAIBANTI; FINLAY AND KEARNEY

160. THE GOVERNMENT AND POLITICS OF THE U.S.S.R.—An analysis of the governmental institutions, party structure and policies of the Soviet Union. Attention will be given to policies affecting the intelligentsia, the workers and the peasants. 3 s.h. (W) KULSKI

180. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA I.—Concepts of political development in new states, using India, Pakistan, Ceylon and Malaya as case studies. Theory and practice of foreign aid and technical assistance as agents of political modernization. 3 s.h. (W) BRAIBANTI

181. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA II.—The political modernization of India and Pakistan since 1947. Constitutional developments as revealed in leading court judgments will be studied. Other topics will be the ideology of administrative reform, formulation of state polity, rural development and party politics. 3 s.h. (W) BRAIBANTI

182. COMPARATIVE GOVERNMENT AND POLITICS: JAPAN.—Although Chinese civilization will be studied as it relates to Japan, primary emphasis will be on the development of Japan's political system, starting with the Taikwa Reform and continuing to the present day. 3 s.h. (W) BRAIBANTI

183. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHEAST ASIA.—An analysis of the development of government in Thailand, Vietnam, Burma, Malaya, Indonesia and the Philippines. Attention will be given to the Islamic, Buddhist and other indigenous cultures of these nations. 3 s.h. (W) KEARNEY

223. POLITICAL PHILOSOPHY FROM PLATO TO MACHIAVELLI.—Intensive analysis of the political philosophies of Plato and Aristotle, a survey of medieval political thought and an analysis of the significance of Machiavelli. 3 s.h. (w) HALLOWELL

224. MODERN POLITICAL THEORY.—An historical survey and philosophical analysis of political theory from the beginning of the seventeenth to the middle of the nineteenth century. Attention is given to the rise of liberalism, the Age of Enlightenment, the romantic and conservative reaction, idealism and utilitarianism. 3 s.h. (w) HALLOWELL

225. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study of modern political institutions and processes, with particular attention to European constitutional government and politics. 3 s.h. (w) COLE

226. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study of modern political institutions and processes, with particular attention to European totalitarian and authoritarian political systems. 3 s.h. (w) COLE AND KULSKI

229. RECENT AND CONTEMPORARY POLITICAL THEORY.—The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Christianity and the social order. 3 s.h. (w) HALLOWELL

231. AMERICAN POLITICAL THEORY.—An analysis of the main currents in American political thought from colonial beginnings to the present day, with emphasis upon the development of liberalism in America. 3 s.h. (w) HALLOWELL

235. THE BRITISH COMMONWEALTH.—An analysis of the political relationships between the members of the Commonwealth and a comparative study of the political systems of the Commonwealth countries, with particular reference to Canada. 3 s.h. (w) COLE; HULL

250. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA I.—Methodology of comparative political analysis. Institutional, functional, problematic and culture-analytic approaches compared. Theoretical problems of induced political and administrative change using India and Pakistan as case studies. 3 s.h. (w) BRAIBANTI

251. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA II.—Political modernization of India and Pakistan emphasizing constitutional change, development of ideology, bureaucratic transition, party politics, law as an instrument of political change, and the community development movement. 3 s.h. (w) BRAIBANTI AND SAYEED

252. COMPARATIVE GOVERNMENT AND POLITICS: JAPAN.—A survey of the civilization of Japan, and an analysis of political development from the Taikwa Reforms to the modern period. 3 s.h. (w) BRAIBANTI

280. COMPARATIVE GOVERNMENT AND POLITICS: SUB-SAHARAN AFRICA.—Particular attention will be given to traditionalism and modernization, ideologies, leadership, party systems, the adaptation of parliamentary institutions, Africanization of the civil services, and the problem of political integration. 3 s.h. (w) PROCTOR

AMERICAN GOVERNMENT AND PUBLIC ADMINISTRATION

109. STATE AND LOCAL GOVERNMENT TODAY.—Problems in state, county and city government including the administration of government services such as education, public welfare, law enforcement; inter-governmental relationships; administrative reorganization; methods of popular control; and the reconstruction of state and local government so as to meet present-day needs. 3 s.h. (E) CHEEK

125. AMERICAN POLITICAL PARTIES AND PRACTICAL POLITICS.—A study of the historical development, organization, and methods of political parties in the United States. 3 s.h. (w) SIMPSON

128. THE JUDICIAL PROCESS.—The judicial process and the role of the judiciary in the development of public policy in the United States. 3 s.h. (w) Open only to Juniors and Seniors. HOWARD

129. GROUPS IN AMERICAN POLITICS.—A study of the composition, methods, and policies of organized groups as they participate in the creation of public opinion and in the formulation of public policy. Attention will be focused on recent national policy in the areas of agriculture, business, labor, education, welfare, foreign affairs, and on the roles that groups play in the formulation of these policies. 3 s.h. (w) SINDLER

137. POLITICAL BEHAVIOR IN ELECTIONS.—The behavioral approach will be used to examine decision-making in the political process. Attention will be focused on the major factors that affect the outcome of elections, such as the characteristics of the American voter, the conduct of campaigns, the influence of propaganda and public relations techniques, and the influence of campaign finance. 3 s.h. (w) SINDLER

138. POLITICAL BEHAVIOR IN POLICY MAKING.—A study of the major factors that come into play in the making of governmental policy decisions. Special attention will be paid to the role of pressure groups and the methods of their lobbyist representatives, to the effects of pressures from constituents, and to the pressures of the executive and legislative branches upon each other. 3 s.h. (w)

141. PUBLIC ADMINISTRATION.—An introduction to the role of administration in the governmental process considering principles of administrative organization, methods of administrative control, personnel and fiscal management. In general the study of the organizational and administrative problems encountered by any government agency charged with carrying out a public policy. 3 s.h. (w) HALL

142. ADMINISTRATIVE RESPONSIBILITY.—An evaluation of political, legal and administrative methods of achieving a responsible bureaucracy in American national government. Comparisons will be made with relevant experience and techniques in other countries such as Great Britain and France. 3 s.h. (w) HALL

146. LEGISLATION.—A study of the composition and structures of legislative bodies and of the legislative process with attention to procedure, methods, techniques, delegation of discretion, and the use of controls. 3 s.h. (w) SIMPSON

161. GOVERNMENT AND PLANNING.—A study of the planning functions at all levels of government in the United States. Particular attention will be devoted to the problems posed for planning by metropolitan growth. 3 s.h. (w) LEACH

164. GOVERNMENT REGULATORY POLICY AND ADMINISTRATION.—A consideration of selected regulatory policies of the American national government, such as anti-trust, transportation and communications, and of the administrative procedures and organizations designed to effect those policies. 3 s.h. (w) HALL

174. POLITICAL IMPLICATIONS OF ECONOMIC LEGISLATION.—A study of political and sectional alignments in the passage of tariff, farm, railway, New Deal and other economic legislation. 3 s.h. (w) SIMPSON

190. CAREER PROBLEMS IN GOVERNMENT.—Principles, techniques, and problems of public service; recent approaches to public personnel practices. 3 s.h. (w) CHEEK

207. AMERICAN CONSTITUTIONAL LAW AND THEORY.—A study of the leading principles of American government, as developed through judicial interpretation of the Constitution. 3 s.h. (w) RANKIN

208. AMERICAN CONSTITUTIONAL LAW AND CURRENT NATIONAL PROBLEMS.—A study of the influence of recent Supreme Court decisions upon the political and constitutional development of the United States. 3 s.h. (w) RANKIN

209. PROBLEMS IN STATE AND LOCAL GOVERNMENT IN THE UNITED STATES.—A study of the historical development of state and local governments, their present organization and subdivisions, and their relation to each other. Special attention is given to the position of the states in the federal union through the study of federal-state, inter-state, and state-local relations. 3 s.h. (w) RANKIN

230. AMERICAN POLITICAL INSTITUTIONS.—A study of the formation and development of institutions of the national government in the United States, with

historical and analytical treatment. Among other topics this course is concerned with the Constitutional Convention of 1787, and the development of Congress, the Presidency, and the Supreme Court. 3 s.h. (w) RANKIN

234. CIVIL-MILITARY RELATIONSHIPS IN AMERICAN GOVERNMENT.—A consideration of the role of the military in American government both in theory and in practice. Special emphasis will be given to formal civil-military structural arrangements for determining policies, such as the National Security Council, and to the degree of civilian control within the military establishment. 3 s.h. (w) CONNERY

241. ADMINISTRATIVE MANAGEMENT.—An advanced course in public administration with special attention being given to the development of scientific management, its application to government in the United States and a consideration of current problems in organization, procedures, work simplification, and management improvement. 3 s.h. (w) CONNERY

242. NATIONAL ADMINISTRATION.—A study of the administrative organization, working concepts and procedures of the United States Government, illustrated through the operations of the Bureau of the Budget. 3 s.h. (w) CONNERY

244. ADMINISTRATIVE LAW AND PROCESS.—The nature and law of the administrative process in the context of American government and politics, with special attention to the powers, procedures, and judicial control of administrative agencies. 3 s.h. (w) HALL

246. GOVERNMENT ADMINISTRATION AND PUBLIC POLICY.—Through use of the laboratory and case study techniques, a consideration of the types of administrative problems that the United States Government encounters in the field of public policy, and their possible solution. 3 s.h. (w) CONNERY

275. THE NATIONAL PARTY SYSTEM.—An intensive examination of selected facets of American national political parties, such as: relationships between presidential and congressional politics, the politics of national conventions, recent foreign policy and party alignments, and the controversy over party government. 3 s.h. (w) SINDLER

276. COMPARATIVE STATE PARTIES AND POLITICS.—A selective analysis of party patterns in the states, including such topics as: classification schemes for state party systems, the impact of various nominating procedures on party organization, relationships between national and state politics, and the influence of party system on the operation of state government, with special attention to the South. 3 s.h. (w) SINDLER

291. PROBLEMS OF URBAN GOVERNMENT.—Analysis of problems in the structure and functions of urban governments in the United States. 3 s.h. (w) RANKIN AND LEACH

292. URBAN ADMINISTRATION.—A study of principles and methods relating to municipal administration in the United States. 3 s.h. (w) RANKIN AND LEACH

INTERNATIONAL LAW AND RELATIONS

121. ELEMENTS OF INTERNATIONAL RELATIONS.—Analysis of international politics, of foundations of national power, and of international cooperation, with emphasis upon attempted solutions of the central problems of international security. 3 s.h. (E & W) KLINE; PROCTOR; FINLAY AND KEARNEY

122. MODERN INTERNATIONAL POLITICS.—An examination of the major problems of post-war international politics with particular attention to the extension of Soviet power, the Western response to this challenge, and the revolutions in the Afro-Asian world. 3 s.h. (E & W) KLINE AND PROCTOR

124. THE NEW STATES OF AFRICA IN WORLD AFFAIRS.—A study of the international political problems arising from the emergence of independent states in sub-Saharan Africa. 3 s.h. PROCTOR AND FINLAY

158. CONTROL OF AMERICAN FOREIGN POLICY.—A consideration of the forces which are responsible for the formulation of American foreign policy, and a study of the important factors which have influenced contemporary United States policy in the major areas of the world. The course includes an analysis of the

respective roles of the President, Congress, Department of State, and the United Nations, as well as military and public opinion. 3 s.h. (w) BALL

221. INTERNATIONAL PUBLIC ORGANIZATION.—A study of the structure and functioning of the United Nations organs, or related specialized agencies such as the International Labor Organization, and of regional agencies such as the Organization of American States and the North Atlantic Treaty Organization. 3 s.h. (w) WILSON

227-228. INTERNATIONAL LAW.—Elements of international law, particularly as interpreted and applied by the United States; rights and duties of states with respect to recognition, state territory and jurisdiction, nationality, diplomatic and consular relations, treaties, treatment of aliens, pacific settlement of disputes, international regulation of the use of force, and collective responsibility. 6 s.h. (w) WILSON

INDEPENDENT READING AND UNDERGRADUATE SEMINAR

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to qualified Juniors by permission of the Director of Undergraduate Studies and of the individual instructor. 3-6 s.h. STAFF

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to qualified Seniors by permission of the Director of Undergraduate Studies and of the individual instructor. 3-6 s.h. STAFF

197, 198. SENIOR SEMINAR IN POLITICAL SCIENCE.—A seminar concerned with the development of political science as a discipline, present frontiers of knowledge and research methods. A common problem will be explored and individual papers will be required on selected aspects of that problem. Required of all majors participating in the departmental honors program. Open only to Seniors. Prerequisite: Consent of the instructor. 6 s.h. (w) STAFF

DEPARTMENTAL MAJOR

Prerequisite: Science 11-12 or 61-62.

Major Requirements: Eighteen semester hours of work in the Department above courses 11-12 or 61-62, including at least nine semester hours of 200 courses.

Related Work: Six hours each in two departments approved by the Political Science adviser. Courses may not be those primarily open to freshmen. Usually related work is taken in the departments of history, economics, sociology or philosophy.

The Department offers work leading to graduation with distinction. See the section on Honors.

PORTUGUESE

For courses in Portuguese, see *Romance Languages,* p. 127.

PSYCHOLOGY

PROFESSOR ALEXANDER, CHAIRMAN; PROFESSOR JONES, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS ADAMS, DAI, DIAMOND, GUTTMAN, KIMBLE; ASSOCIATE PROFESSORS BANHAM, BONEAU, BORSTELMANN, BREHM, CARSON, LAKIN, MCHUGH, WALLACH; RESEARCH ASSOCIATE PROFESSOR GAFFRON; ASSISTANT PROFESSORS ALTROCCHI, ERICKSON, GREENWOOD, KREMEN, SCHIFFMAN; LECTURERS COHEN, CROVITZ, EISDORFER, GEHMAN, KRUGMAN, OBRIST, PEELE, SCHMAVONIAN, SOMJEN, STEDMAN, THOMPSON; INSTRUCTOR HINMAN

Psychology 91 or its equivalent is a prerequisite for all other courses in psychology. Six semester hours in psychology (including Psychology 91) or special permission of the course instructor or the Director of Undergraduate Studies are required for admission to all psychology courses over 140.

91. INTRODUCTORY PSYCHOLOGY.—An introduction to the facts, principles, and problems of psychology through a study of motivation, emotions, perception, sensation, thinking, memory, learning, social behavior, individual differences, and personality. Offered both semesters. 3 s.h. (E & W) STAFF

100. PERSONALITY.—Representative theories of personality, from Freud to the present, emphasizing problems of normal personality structure, dynamics, development, and assessment. 3 s.h. ALEXANDER AND KREMEN

Not open to students who have had Psychology 116.

101. INTRODUCTORY SOCIAL PSYCHOLOGY.—Problems, concepts and methods in the study of social interaction and interpersonal influence. Topics include: Socialization; social factors in perception and learning; psychological principles underlying conformity; conditions affecting social interaction. 3 s.h. JONES AND BREHM

104. COMPARATIVE PSYCHOLOGY.—An examination of the bearing upon general psychological theory of experimental investigations of animal behavior in the fields of motivation and learning. 3 s.h. (w) ADAMS

110. APPLIED PSYCHOLOGY.—Applications of psychology to problems of personnel selection, industrial efficiency, advertising and selling, and other problems of practical interest. 3 s.h. (w) MCHUGH

111. ADVANCED GENERAL PSYCHOLOGY.—A more intensive study of several selected problem areas in the field of general psychology with special emphasis on experimental methods and findings in the areas considered. 3 s.h. (w) KIMBLE

116. PSYCHOLOGY OF ADJUSTMENT.—The course is planned to give an adequate understanding of problems of adjustment and mental hygiene. Lectures and discussions cover an application of the principles and findings of normal and abnormal psychology, as these relate to the adjustment of the average individual in our changing society. 3 s.h. (w) STAFF

Not open to students who have had Education 68 or Psychology 100. Open normally to nursing students and to others by permission of the instructor.

117. STATISTICAL METHODS IN PSYCHOLOGY.—Elementary statistical techniques and their application to the analysis and interpretation of psychological data. Theory of inference is stressed. 3 s.h. (w) BONEAU AND SCHIFFMAN

118. EXPERIMENTAL METHODS IN PSYCHOLOGY.—The procedures and methods of human and animal experimentation in such areas as learning, motivation, and perception. 3 s.h. (E) STAFF

121. CHILD PSYCHOLOGY.—A survey of theory and research on growth and behavior from infancy to adolescence, with special emphasis upon personality and cognitive development. 3 s.h. (w) BORSTELMANN AND MCHUGH

122. ADJUSTMENT OF THE PRE-SCHOOL CHILD.—Study and application of techniques of observing, recording and interpreting the behavior of the pre-school child. The course is designed to meet the needs of students interested in the personality, development and social adjustment of children. One hour lecture and 4 hours laboratory. 3 s.h. (E) STAFF

126. ADOLESCENT PSYCHOLOGY.—The mental, social and emotional development of adolescence and youth will be studied with special attention given to such topics as interests, motivations, home problems, sex differences, recreation, delinquency, and development for citizenship. Prerequisite: Psychology 121 or Education 118, or permission of the instructor. 3 s.h. (w) MCHUGH

130. PRINCIPLES AND METHODS OF PSYCHOLOGICAL EVALUATION.—This is an introductory course in test methods used by psychologists in measuring and evaluating mental processes. The nature, purposes and utilization of various types of tests and psychological techniques will be discussed and demonstrated. Among the tests to be studied will be standard scales of intelligence; tests of special abilities, aptitudes, attitudes and interests; personality tests, rating scales and projective methods. Prerequisite: 6 s.h. in Psychology. 3 s.h. (w) BANHAM

132. THE PSYCHOLOGY OF INDIVIDUAL DIFFERENCES.—A study of the nature and causes of individual and group variations in intelligence, special abilities, social and emotional characteristics. These will be considered in relation to developmental sequence, aging factors, sex, race, biological inheritance, education and socio-economic conditions. Prerequisite: Psychology 130 or permission of instructor. 3 s.h. (w) BANHAM

141. PERSONALITY AND BEHAVIOR DISORDER.—Behavior disorder studied from the viewpoint of the psychological principles underlying the adjustment of the deviant personality. Prerequisite: Psychology 100. 3 s.h. (w)
ALTROCCHI, CARSON, AND LAKIN

142. INSTRUMENTAL BEHAVIOR.—A laboratory course using animal subjects in operant conditioning situations. Class members carry out a series of observations on conditioning, discrimination, motivation, and other basic phenomena. 3 s.h. (w) GUTTMAN

144. THE PSYCHOLOGY OF LEARNING.—A survey of the basic facts and principles of human and animal learning. Students in the course will perform an independent experiment. 3 s.h. (w) KIMBLE AND BONEAU

145. EXPERIMENTAL APPROACHES TO PERSONALITY.—Experimental methods applied to personality research with emphasis upon psychological studies in such areas as anxiety, conflict and frustration. Students will perform representative experiments. Prerequisite: Psychology 100 or permission of the instructor. 3 s.h. (w) WALLACH

147. EXPERIMENTAL SOCIAL PSYCHOLOGY.—Intensive consideration of selected problems in group dynamics, attitude change, and interpersonal perception. Current research and theory are stressed. Class members conduct individual research projects. Prerequisite: Psychology 101 or permission of the instructor. 3 s.h. (w) BREHM AND JONES

148. PSYCHOLOGY OF PERCEPTION AND THINKING.—A study of the basic phenomena of perception and thinking as determined by conditions in the external situation and in the person, biological and psychological. Students will perform representative experiments. 3 s h. (w) CROVITZ

151. PSYCHOLOGY AND INTERNATIONAL RELATIONS.—This course will explore the application of psychological theories to problems of international relations including those concerned with inter-group conflict and its resolution, group identification and ethnocentrism, and the complexities of national character. The course will be problem oriented and conducted on a seminar basis. Theoretical papers and experimentation along the lines of topics mentioned above will be expected. Prerequisites: Psychology 91, 100 or 101, and consent of the instructor. (w) LAKIN

152. PHYSIOLOGICAL PSYCHOLOGY.—Neural bases of behavior, sensory and motor functions of the nervous system, and problems of emotion, motivation, and consciousness. Laboratory in psychophysics and the electrical activity of the nervous system. Prerequisites: Physics 1-2 or Chemistry 1-2 or permission of instructor. 3 s.h. (Formerly Psychology 112.) ERICKSON

153. INTRODUCTION TO BIOLOGICAL PSYCHOLOGY.—Application of biological principles to psychology. Among the concepts considered are species, gene, homeostasis, internal environment, reflex, synapse, organ, and receptor specificity. Phylogeny of the cortex treated in detail. Prerequisite: Zoology 1-2 and Comparative Anatomy, or permission of the instructor. 3 s.h. (Formerly Psychology 108) DIAMOND

171, 172. JUNIOR TUTORIAL.—Small group discussions of influential books and articles in psychology. Prerequisites: 6 s.h. in psychology and permission of Director of Undergraduate Studies. 4 s.h. BREHM AND STAFF

173, 174. SENIOR TUTORIAL.—Small group discussions of influential books and articles in psychology. Prerequisite: 12 s.h. in psychology and permission of Director of Undergraduate Studies. 4 s.h. BREHM AND STAFF

175, 176. INDEPENDENT RESEARCH.—Independent investigation of topics of special interest. Admission requires formulation of a study plan with a faculty supervisor and approval of the Director of Undergraduate Studies. Prerequisite: 9 s.h. of Psychology. 6-12 s.h. BREHM AND STAFF

191, 192. INDEPENDENT STUDY AND RESEARCH–I.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the department. See page 38. 6 s.h. BREHM AND STAFF

193, 194. INDEPENDENT STUDY AND RESEARCH–II.—Directed reading and research. Open only to highly qualified students in the senior year, by permission of the department. See page 38. 6-12 s.h. BREHM AND STAFF

The following courses are open to selected undergraduates with permission of the instructor:

203. PSYCHOLOGY OF PERCEPTION.—An examination of current systematic formulations with emphasis upon the intensive analysis of a variety of representative investigations. 3 s.h. STAFF

204. COMPARATIVE PSYCHOLOGY.—The study of behavior as related to species and of speciation as dependent upon behavior; instinct, imprinting and learning at different phylogenetic levels. 3 s.h. ADAMS

210. COGNITION AND HIGHER MENTAL PROCESSES.—An intensive analysis of the literature on thinking, problem solving, creativity, language, and related topics. Emphasis is upon the functional significance of these aspects of intellectual activity and upon the experimental methodology involved in their study. 3 s.h. BONEAU

213, 214. CONDITIONING AND LEARNING.—A survey of the literature on classical and instrumental conditioning and other forms of simple learning. Emphasis is on classical conditioning in 213 and on instrumental behavior in 214. 6 s.h. KIMBLE AND GUTTMAN

215. DEVELOPMENTAL PSYCHOLOGY.—A consideration of selected research areas in child behavior and development, including personality, cognition, perception and learning. Prerequisite: special permission of the instructor. 3 s.h. BORSTELMANN

216. BIOLOGICAL PSYCHOLOGY.—The methods of biology (as applied to psychology), especially in neurophysiology, neuroanatomy, and genetics. Topics covered include: (a) the genetics of behavior, (b) the organization of the dorsal thalamus and neocortex, (c) the limbic system and hypothalamus. Methods covered include: (a) ablation method, (b) method of evoked potential, (c) electrical stimulation of the brain, (d) classical and physiological genetics. 3 s.h. DIAMOND

217. RESEARCH METHODS IN SOCIAL PSYCHOLOGY.—Presents the theory and practice of data collection methods in social psychology. Emphasis is on the interplay between design and technique. The methods covered include formal scaling procedures, systematic observational techniques and others appropriate to field studies, field experiments, surveys and laboratory experiments. 3 s.h. BREHM

218. SOCIAL PSYCHOLOGY.—An examination of selected problem areas in social psychology including social factors in cognition, models of social interaction, conformity and social influence, and attitude development and change. Recent research is emphasized in relation to its historical context and its bearing on the development of theory. 3 s.h. JONES

220. PHYSIOLOGICAL BASES OF BEHAVIOR.—Classical studies on the neuropsychology of learning and behaviors such as hunger, thirst and sex. The central role of neuroendocrinology in the physiological bases of motivated behavior. 3 s.h. STAFF

225. PERSONALITY AND EXPERIMENTAL DYNAMICS.—Application of experimental methods to the study of psychodynamics, personality development and behavior pathology. Stress is on research in early experience and its influence on personality, frustration, conflict, anxiety, and the mechanisms of defense and adaptation. 3 s.h. STAFF

234. SEMINAR IN PERSONALITY.—Selected research topics of current interest in experimental study of personality, including risk-taking, creativity, and cognitive styles. 3 s.h. WALLACH

237. FUNCTIONAL NEUROPHYSIOLOGY.—Considers the mechanisms of activity of the individual neuron and groups of nerve cells, the principles of activity of the afferent and efferent neural systems, and the integrative and associative functions of the nervous systems. Laboratory demonstrations and participation. Permission of the instructor. 3 s.h. ERICKSON

238. THE ELECTROENCEPHALOGRAM AND PSYCHOLOGICAL FUNCTION.—A survey of experimental and clinical literature on brain wave correlates of intelligence, personality, behavior disorders, epilepsy, sleep, sensory stimulation, reaction time, and attention. Special emphasis is placed on the electrophysiology of conditioning and learning. Lectures, laboratory demonstrations and clinical case presentations. 3 s.h. OBRIST

239. BEHAVIORAL CORRELATES OF BRAIN DAMAGE IN MAN.—Effects of brain damage on psychological functioning. Known brain-behavior relationships and problems encountered in the study of brain function. Laboratory demonstrations for assessment of cerebral dysfunction through the use of standard psychological tests. 3 s.h. THOMPSON

245, 246. PERSONALITY THEORY AND ASSESSMENT.—An examination of representative models of human functioning from Freud to the present day. Included are examples from psychoanalytical, field theoretical and behavioristic approaches. Laboratory sessions will be concerned with personality assessment of normal human subjects over time. Interview and testing procedures will be introduced and the data gathered assessed against the theoretical models studied. 6 s.h. ALEXANDER AND KREMEN

265. FUNDAMENTAL STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—Introduction to probability and the use of statistics in description and hypothesis testing in psychology including the following applications: correlational techniques, chi-square and t tests, distribution-free tests and one-way analysis of variance. Prerequisite: Psychology 117-118 or equivalent. 3 s.h. BONEAU

266. ADVANCED STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—The basic theory and application of analysis of variance techniques to complex experimental designs will be covered. Additional advanced techniques, including factor analysis, will be introduced. Prerequisite: Psychology 265 or equivalent. 3 s.h. BONEAU

292. HISTORY OF PSYCHOLOGY.—The history of psychology, particularly in the experimental period of the past century and of its involvement in biology since Darwin. 3 s.h. ADAMS

DEPARTMENTAL MAJOR

Prerequisite: Psychology 91 or equivalent.

Major Requirements: 24 semester hours in psychology, including Psychology 91, 117, and a minimum of two courses numbered above 140.

Related Work: 18 semester hours which may include certain courses in chemistry, economics, education, English, linguistics, mathematics, philosophy, physics, political science, sociology-anthropology and zoology.

RELIGION

PROFESSOR PRICE, CHAIRMAN; ASSISTANT PROFESSOR WHITE, DIRECTOR OF UNDERGRADUATE STUDIES; ASSOCIATE PROFESSOR OSBORN, SUPERVISOR OF FRESHMAN INSTRUCTION; ASSOCIATE PROFESSORS BRADLEY, JONES, PHILLIPS, POTEAT, AND SULLIVAN; ASSISTANT PROFESSORS DANIELS, LANGFORD, MCCOLLOUGH, AND WINTERMUTE; VISITING ASSISTANT PROFESSORS LOWRIE AND SHRIVER; DR. CRESSON; MESSRS. CROSSLEY AND LORD

The purpose of the undergraduate program of instruction in religion is to make the students aware of the influence of religion in the history of mankind and in the contemporary world, and to help him appreciate its significance in his own experience. Attention is centered on the Bible, the history and thought of Christianity, and the development of other religious traditions. In addition to the basic courses designed to fulfill the University requirement in religion, advanced courses are offered to meet the needs of specially interested students. In every case the student is encouraged to consider carefully his own religious convictions, to the end that he may reach a more intelligent understanding of his rôle in the world and of his relation to God.

Students who have fulfilled the uniform course requirement in religion are eligible to elect any course numbered 100 or above, except those for which additional prerequisites are prescribed. Courses numbered below 100 may not be taken by those who have completed the uniform course requirements in religion.

1-2. THE ENGLISH BIBLE.—A comprehensive survey of the books of the Old and New Testaments. The literature is examined in the light of its origin in the history and religion of the people of the Bible, in order that its theological significance in its own day and in ours may be understood. Open only to freshmen. 6 s.h. STAFF

51-52. THE ENGLISH BIBLE.—A survey of the Old and New Testaments, similar to Religion 1-2 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion 1-2. 6 s.h. STAFF

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 3 s.h. STAFF

65. JESUS: THE MAN AND HIS MESSAGE.—A detailed examination of the Gospel records, for the purpose of recovering the person and mission of Jesus. Attention will be given to conceptions of Christ in the history of the Church, and to his contemporary significance. Prerequisite: Religion 55. Not open to students who have completed the uniform course requirements in religion. See Religion 121. 3 s.h. PHILLIPS

85. INTRODUCTION TO CHRISTIAN ETHICS.—An analysis of the Biblical and theological bases for an understanding of man's moral situation, with a study of the social implications of Christianity in selected problem areas. Prerequisite: Religion 55. Not open to students who have completed the uniform course requirements in religion. See Religion 152. 3 s.h. MCCOLLOUGH

93. SURVEY OF THE WORLD'S LIVING RELIGIONS.—An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, the world's living religions are dealt with in terms of historical development and the beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55. Not open to students who have completed the uniform course requirements in religion. See Religion 175. 3 s.h. BRADLEY AND SULLIVAN

100. PRINCIPLES OF INVESTIGATION.—An introduction to the resources and methods appropriate to advanced study in Religion. Required of all majors; open to others. 1 s.h. JONES AND WHITE

111. THE PROPHETS OF THE OLD TESTAMENT.—A study of the origin and rise of the prophetic movements, the message of the prophets in their historical setting, the contributions of this movement to the Biblical view of God and history, and the significance of the prophets for today. 3 s.h. WINTERMUTE

121. THE MISSION AND MESSAGE OF JESUS.—An analysis and interpretation of the Gospels, designed to afford the student a fuller understanding of Jesus and his mission. Not open to students who have received credit for Religion 65. 3 s.h. DANIELS AND PRICE

123. THE LIFE AND LETTERS OF PAUL.—A study of the available sources for the life of Paul, his rôle in the expansion of the Christian movement, the most important aspects of his thought, and his continuing influence. 3 s.h. DANIELS

131. HISTORY OF CHRISTIANITY FROM THE EARLY CHURCH THROUGH THE REFORMATION.—A study of events, trends, personalities, and interpretations that have shaped Christianity from the time of the early Church through the sixteenth century, intended to acquaint the student with the Christian heritage and to contribute to his understanding of contemporary Christianity. 3 s.h.

133. HISTORY OF CHRISTIANITY SINCE THE REFORMATION.—A study of events, trends, personalities, and interpretations which have shaped Christianity

since the Reformation, with emphasis upon those which contribute to an understanding of the contemporary religious situation. 3 s.h.

137. PROTESTANTISM IN AMERICA.—A study of representative men, movements, and thought in American Protestantism to 1918. 3 s.h. JONES

138. CONTEMPORARY RELIGIONS IN THE UNITED STATES.—Judaism, Catholicism, and Protestantism are studied with reference to their distinctive beliefs and practices. A comparison is made of common and dissimilar features. 3 s.h. PHILLIPS

140. CHRISTIAN BELIEFS.—An introductory study of important Christian teachings concerning God, Jesus Christ, sin and salvation, etc., intended to serve as a basis for the student's evaluation of his own religious concepts. 3 s.h. LANGFORD AND MCCOLLOUGH

144. PROBLEMS OF RELIGIOUS THOUGHT.—A study of the relation of belief in God to various other types of knowledge and experience, such as the research of natural and social scientists and the facts of suffering, human tragedy, and evil. 3 s.h. LANGFORD AND POTEAT

149. CURRENT INTERPRETATIONS OF CHRISTIANITY.—Contemporary types of Christian thought as seen through the writings of such leading representatives as Karl Barth, John Baillie, Paul Tillich, and Reinhold Niebuhr. 3 s.h. OSBORN

152. CHRISTIAN ETHICS.—A systematic study of the ethical implications of Biblical religion. Attention is given both to the historical development of the Christian ethic and to the responsibility of the Christian in the various aspects of contemporary social life, such as marriage, the state, race, etc. Not open to students who have received credit for Religion 85. 3 s.h. MCCOLLOUGH

156. CHRISTIAN MARRIAGE AND THE FAMILY.—Marriage and the family in American society studied from the Christian perspective. Attention will be given to the teachings of the churches and of psychologists and sociologists concerning courtship and marriage, sex, parent-child relationships, mixed marriages, and divorce. 3 s.h. PHILLIPS

160. CHRISTIAN EDUCATION.—A study of the educational work of the Church, with emphasis upon the philosophy, objectives and functions of Christian education. 3 s.h. DANIELS

171. RELIGIONS OF THE ANCIENT NEAR EAST.—The history and literature of religions in the cultures of Egypt, Mesopotamia, Persia, and Palestine from earliest times to 600 B.C. 3 s.h. WINTERMUTE

172. RELIGIOUS QUESTS OF THE GRECO-ROMAN WORLD.—The religious movements in the Hellenistic age, including sectarian Judaism, Persian dualism, the mystery cults, and Gnosticism. 3 s.h. WINTERMUTE

175. NON-CHRISTIAN RELIGIONS OF THE MODERN WORLD.—An examination of the beliefs of Islam and the religions of India, China, and Japan. Emphasis will be placed upon the sacred literature, world view, history, and cultural and social significance of the principal non-Christian religions. Not open to students who have received credit for Religion 93. 3 s.h. BRADLEY AND SULLIVAN

176. WORLD RELIGIONS AND SOCIAL CHANGE.—Religious traditions and institutions in national and international affairs. Intensive study of selected areas of Asia and Africa with special stress on missionary religions and political change. 3 s.h. BRADLEY

178. MYTH AND SYMBOL.—Historical and phenomenological study of religious myth and symbol, Christian and non-Christian. The nature and function of myth in religion; types of myths, with particular attention to cosmogonic myths. The nature of religious symbols; structural and comparative study of selected symbols. 3 s.h. PARTIN

179. MYSTICISM: SACRED AND PROFANE.—Varieties of mystical experience, both religious and non-religious; representative mystics in Hinduism, Islam, Chris-

tianity, and Mahayana Buddhism; the nature and significance of mysticism within these traditions. Prerequisite: Religion 93 or 175. 3 s.h. SULLIVAN

187. RELIGIOUS VALUES IN CLASSICAL AND EUROPEAN LITERATURE.—A consideration of the religious insights, explicit and implied, in representative writings. 3 s.h. WHITE

189. MAN IN MODERN PROPHETIC THOUGHT.—The individual and society in the writings of Kierkegaard, Nietzsche, and Berdyaev. 3 s.h. MCCOLLOUGH

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the department. 6 s.h. See page 38.

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the senior year, by permission of the department. 6-12 s.h. See page 38.

195-196. HONORS RESEARCH.—The first semester is a seminar in which methods of research are applied to selected problems in religion; in the second semester, independent research projects are reported to the class, and eventuate in research papers. Normally taken in the junior year. 6 s.h. Staff

Senior Seminars. The following seminars parallel the five categories of courses offered in the department. They afford opportunities for more intensive reading and individual research. Each major must take one of these courses in his senior year; they are open also to qualified non-majors. To be eligible for a seminar the student (major or non-major) must have completed at least one course in this area or pass the qualifying examination on the departmental reading list in that category. Each seminar will be offered as frequently as student demand and available personnel permit.

203. BIBLICAL STUDIES.—3 s.h.

204. CHURCH HISTORY.—3 s.h.

205. THEOLOGY AND ETHICS.—3 s.h.

206. CHRISTIANITY AND CULTURE.—3 s.h.

207. HISTORY OF RELIGIONS.—3 s.h.

210. CONTEMPORARY BRITISH THEOLOGY.—Selected problems in representative British theological writings after 1920. Prerequisite: permission of the instructor. 3 s.h. LANGFORD

228. THE THEOLOGY OF THE GOSPEL AND THE EPISTLES OF JOHN.—A study of the origin of these writings, the provenance of their thought forms and symbolism, their influence on the early Church, and their contemporary significance. Prerequisite: permission of the instructor. 3 s.h. PRICE

248. THE THEOLOGY OF KARL BARTH.—An historical and critical study of the theology of Karl Barth. Prerequisite: permission of the instructor. 3 s.h. OSBORN

279. RELIGIONS OF EAST ASIA.—Major traditions of China and Japan with emphasis upon the development and expansion of Buddhism. Prerequisite: permission of the instructor. 3 s.h. SULLIVAN

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the main sources and traditions of the classical civilization of the Indian subcontinent with particular attention to religious movements and institutions. (Also listed as History 285.) Prerequisite: permission of the instructor. 3 s.h. SULLIVAN

DEPARTMENTAL MAJOR

Prerequisite: Completion of the uniform course requirement in religion. (The sequence Religion 1-2 or 51-52 is recommended.)

Major Requirements: Twenty-five semester hours selected as follows:

A. Religion 100 (to be taken in the semester after becoming a major).

B. Three hours from each of the following categories: (A major may fulfil, without credit, the requirement in any one of these areas by passing the departmental examination on the basic book list for that category).

1. Biblical studies: 111, 121, 123, 228

2. Church history: 131, 133, 137, 138
3. Theology and ethics: 140, 149, 152, 156, 189, 210, 248
4. Christianity and culture: 144, 187
5. History of religions: 17, 172, 175, 176, 178, 179, 279

C. A three hour senior seminar in one of the five categories.

D. At least six hours elected from the departmental curriculum.

Related Work: Eighteen semester hours, including a minimum of six hours in each of two departments. There is no restriction in principle as to departments in which related work may be taken. The departmental major adviser will take into consideration the vocational objective of the student and the need to select courses which will strengthen his major work.

The Department offers work leading to graduation with distinction which is normally begun in the junior year. See the section on graduation with distinction in this *Bulletin.*

ROMANCE LANGUAGES

PROFESSOR FEIN, CHAIRMAN; PROFESSOR DOW, DIRECTOR OF UNDERGRADUATE STUDIES IN FRENCH; PROFESSOR DAVIS, DIRECTOR OF UNDERGRADUATE STUDIES IN SPANISH; ASSOCIATE PROFESSOR CORDLE, SUPERVISOR OF FRESHMAN INSTRUCTION IN FRENCH; ASSOCIATE PROFESSOR TORRE, SUPERVISOR OF FRESHMAN INSTRUCTION IN SPANISH; PROFESSORS CASTELLANO, CHERPACK, FOWLIE, PREDMORE, AND WARDROPPER; VISITING PROFESSOR WILLIAMSON; ASSOCIATE PROFESSORS GRANT AND VINCENT; ASSISTANT PROFESSORS BARLOW, BUSII, CASTELLANO, DOW, FLINT, HULL, MILLER, RIPLEY, TER HORST, TÉTEL, AND WALKER; INSTRUCTORS BRYAN, DANIEL, AND PERRY; FLINT, GOODE, GRANT, JENNY, MORGANROTH, SIEBER, SUSSKIND, AND UPCHURCH

French 63-64 and Spanish 63-64 are the prerequisites for all elective courses. Students who, by reason of foreign residence, have had special opportunities in French or Spanish must be classified by the Director of Undergraduate Studies.

FRENCH

1-2. ELEMENTARY FRENCH.—Introduction to understanding, speaking, reading, and writing French. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (E & W)
HULL AND STAFF

63-64. INTERMEDIATE FRENCH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: French 1-2 or two years of high-school French. 8 s.h. (E & W)
VINCENT AND STAFF

91, 92. INTRODUCTION TO FRENCH LITERATURE.—An introduction to the major writers of the French literary tradition. Selections and complete works of poetry, fiction, theater, and essay. In the first semester: Middle Ages through the 18th century. In the second semester: 19th and 20th centuries. Lectures and discussions; short essays and tests. Conducted in French. Prerequisite: French 63-64 or equivalent. 6 s.h. (E & W) CORDLE AND STAFF

97. SPOKEN FRENCH.—Intensive instruction in the spoken language: contemporary French prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: French 64. 3 s.h. (E) BRYAN, DOW, AND BUSH

104. THE SIXTEENTH CENTURY.—An introduction to the spirit of the French Renaissance as reflected in the literature of the age of Rabelais and Montaigne, Ronsard and Du Bellay. 3 s.h. (E) VINCENT

106. THE WORLDS OF ROUSSEAU.—Studies of Rousseau's conception of the real world (the *Discours*), the ideal world (*Émile and the Contrat Social*), the fictional world (*La Nouvelle Héloïse*), and his personal world (the *Confessions* and the *Rêveries*). 3 s.h. (E) CHERPACK

107. THE WORLDS OF VOLTAIRE.—Studies of Voltaire's conception of the real world (historical, philosophical, and satirical writings), his aesthetic world (poetry, drama, criticism), and his personal world (correspondence). 3 s.h. (E) CHERPACK

108. FRENCH ROMANTICISM.—The beginnings of the modern era, in its quest for new values and a new expression, as studied through the great lyric poets and prosodists of the first half of the nineteenth century. Readings from Chateaubriand, Lamartine, Musset, Hugo, Vigny and others. 3 s.h. (E) GRANT AND RIPLEY

109. TOWARD MODERNISM IN FRENCH POETRY.—An introduction to modern trends in the nineteenth century: emergence from traditional Romanticism; Art for Art's Sake and the Parnassians (Gautier, Leconte de Lisle); the transition from Decadence to Symbolism (Baudelaire, Verlaine, Rimbaud, and Mallarmé). 3 s.h. (E) BARLOW

111. FRENCH DRAMA OF THE NINETEENTH CENTURY.—A survey of the French theatre from the Romantic period to the *Théâtre libre*. 3 s.h. (E) DOW

112. FRENCH DRAMA OF THE TWENTIETH CENTURY.—Reading of representative plays selected from the works of Bernstein, Maeterlinck, Romains, Sarment, Vildrac, J.-J. Bernard, Claudel, Lenormand, Pagnol, Giraudoux, Anouilh, and others. 3 s.h. (E) DOW

113. THE CLASSICAL IDEAL.—The cultural hegemony of France in seventeenth century Europe. The classical masterpieces as the rational focus of her vigorous thought and art. Descartes, Pascal, Corneille, Racine, Molière, and others. 3 s.h. (E) WALKER

127, 128. ADVANCED COMPOSITION AND CONVERSATION.—During the first semester elements of syntax are briefly reviewed, along with constant drill in the conversational idiom. In the second semester, there are exercises in free composition with intensified treatment of pronunciation and diction. Prerequisite: 97 or consent of instructor. 6 s.h. (E) MRS. DOW, TÉTEL, AND VINCENT

130. TWENTIETH-CENTURY FRENCH POETRY.—In the wake of symbolism: Valéry and Claudel; poetry as ritual: Péguy, Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John Perse. 3 s.h. (W) FOWLIE

134. CONTEMPORARY FRENCH LIFE AND THOUGHT.—An introduction to the essential currents in French thought since 1895. Representative literary works are used as a basis for analysis and discussion of the contemporary scene. 3 s.h. (W) CORDLE AND BUSH

181-182. INTRODUCTION TO FRENCH.—Intensive introduction to the language. Modern readings. Open only to students in the Honors-Masters program who have completed the second college year of another foreign language. 6 s.h. (E)

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified juniors by permission of the Department. See page 38. 6 s.h.

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified seniors by permission of the Department. See page 38. 6 -12 s.h.

209. ADVANCED COMPOSITION AND SYNTAX.—A detailed study of the morphological and syntactic structure of the French language; practice in writing various styles of French; vocabulary study. 3 s.h. (W) HULL

210. FRENCH PHONETICS.—The phonemic structure of contemporary French. Sounds, intonation. Practice in transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied to French. 3 s.h. (W) HULL

213. FRENCH CLASSICISM.—Its initial phase. Readings from Malherbe, Balzac, Voiture, Descartes, Corneille, Molière, and others. 3 s.h. (W) CHERPACK

214. FRENCH CLASSICISM.—Its maturity. Readings from Pascal, Racine, La Fontaine, La Rochefoucauld, Boileau, Bossuet, Madame de Sévigné, La Bruyère, Saint-Simon, and others. 3 s.h. (W) CHERPACK

217. MALLARMÉ AND RIMBAUD.—The symbolism and the formal elements of Mallarmé's poetry. The poetic theory and the psychic elements in Rimbaud's poetry. 3 s.h. FOWLIE

219. OLD FRENCH LITERATURE.—An introduction to the reading of medieval French literary texts. 3 s.h. (w) VINCENT

221. THE NINETEENTH CENTURY FRENCH NOVEL.—The initial phase. The Romantic hero in conflict with society, with special emphasis on the works of Stendhal and Balzac. 3 s.h. (w) GRANT

222. THE NINETEENTH CENTURY FRENCH NOVEL.—A continuation of 221. The decline of the individual hero. Flaubert and Zola will receive intensive study. 3 s.h. (w) GRANT

223. FRENCH LITERARY CRITICISM.—A history of critical theory in France and a study of the major critics from the Renaissance to today. 3 s.h. FOWLIE

225, 226. FROM RENAISSANCE TO BAROQUE IN FRENCH LITERATURE OF THE SIXTEENTH CENTURY.—First semester: literary prose. Readings from Jean Lemaire de Belges, Marguerite de Navarre, Rabelais, Montaigne, and others. Second semester: poetry and theater. Readings from Marot, Scève, Labé, Saint Gelais, the Pléiade, d'Aubigné, Sponde, Du Bartas, Garnier, and others. 6 s.h. (w) TÉTEL

228. FRENCH POETRY OF THE TWENTIETH CENTURY.—In the wake of symbolism: Valéry and Claudel; poetry as ritual: Péguy; Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John Perse. 3 s.h. FOWLIE

233. CONTEMPORARY FRENCH THEATRE.—A study of dramatic theory; the art of the leading directors; and the major texts of Claudel, Giraudoux, Anouilh, Sartre, Beckett, Ionesco, Genet, etc. 3 s.h. FOWLIE

234. PROUST.—A study of *A la recherche du temps perdu*. The thematic structure and the aesthetics of the work. 3 s.h. FOWLIE

236. BAUDELAIRE.—A study of the poetry and criticism of Baudelaire as contributing to the origins of modern art and literature. 3 s.h. (w) FOWLIE

241, 242. FRENCH LITERATURE AND THOUGHT IN THE AGE OF ENLIGHTENMENT.—First semester: The new philosophy and its propagation. Lectures and discussions involving texts by Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and others. Second semester: the crisis in literary aesthetics. Readings, lectures, and discussions bearing on the clash between Classicism and new literary orientations. 6 s.h. (w) CHERPACK

245. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—The metamorphoses of Symbolism. A study of the work of Proust, Gide, and Claudel. 3 s.h. (w) CORDLE

246. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—The Existentialist conversion. A study of the work of Malraux, Sartre, and Camus. Extensive readings from the varied works of the three writers. 3 s.h. (w) CORDLE

248. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—Three Modern Prophets. Extensive readings from Bloy, Bernanos, Péguy. 3 s.h. (E) BUSH

ITALIAN

181-182. ITALIAN.—Intensive introduction to the language. Modern readings. Completion of the second college year of another foreign language will normally be required as a prerequisite. 6 s.h. (E) TÉTEL

283. DANTE: LA DIVINA COMMEDIA.—Explication of the poem with particular attention to literary structure. Reading in Italian or English. 3 s.h. (w) WILLIAMSON

288. THE RENAISSANCE.—Petrarch, Boccaccio and Ariosto. 3 s.h. (w) TÉTEL

PORTUGUESE

181-182. PORTUGUESE.—Intensive introduction to the language. Modern readings. Completion of the second year of another foreign language will normally be required as a prerequisite. 6 s.h. (w) MILLER

SPANISH

1-2. ELEMENTARY SPANISH.—Introduction to understanding, speaking, reading, and writing Spanish. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (E & W)
MILLER AND STAFF

63-64. INTERMEDIATE SPANISH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: Spanish 1-2 or two years of high-school Spanish. 8 s.h. (E & W)
FLINT AND STAFF

91, 92. INTRODUCTION TO SPANISH LITERATURE.—An introduction to the major writers of the Spanish literary tradition. Selections and complete works of poetry, fiction, theater, and essay. In the first semester: Middle Ages through the 18th centuries. In the second semester: 19th and 20th centuries. Lectures and discussions; short essays and tests. Conducted in Spanish. Prerequisite: Spanish 63-64 or equivalent. 6 s.h. DAVIS AND STAFF

97. SPOKEN SPANISH.—Intensive instruction in the spoken language: contemporary Spanish prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: Spanish 64. 3 s.h. (E)
PREDMORE, FLINT, MILLER, AND TORRE

156. REPRESENTATIVE WRITERS OF SPANISH AMERICAN LITERATURE.—Study of works which are examples of the principal literary currents after 1880. 3 s.h. (W) FEIN

161. SPANISH LITERATURE OF THE RENAISSANCE AND THE BAROQUE.—A study of selected works of the sixteenth and seventeenth centuries with attention to their reflection of social, religious, and political ideas. 3 s.h. (E)
MILLER AND TER HORST

162. SPANISH ROMANTICISM.—A study of the romantic spirit in modern Spanish literature. 3 s.h. (E) TORRE

163. THE GENERATION OF 1898.—A study of the "Spirit of 1898" with special emphasis on the novel and essay. The precursors: "Clarín" and Ganivet; Unamuno, Baroja, "Azorín," Valle-Inclán; influence on the next generation: Pérez de Ayala and Ortega y Gasset. 3 s.h. (E) FLINT

164. SPANISH CIVILIZATION.—This course is designed to develop an understanding of the Spanish cultural heritage through the study of selected historical, literary and artistic materials. 3 s.h. (E) FLINT

165. ANALYSIS OF GREAT SPANISH AUTHORS.—A close textual study of a few literary texts with some considerations of methods of literary criticism. The course is designed to give the student insight into various ways of interpreting and understanding literary works so that his experience of literature in general may be enriched. 3 s.h. (E) WARDROPPER

176. ADVANCED CONVERSATION.—This course is designed to develop facility of expression through constant drill on vocabulary and conversational idiom. Time will be devoted to a review of the essentials of Spanish syntax. Prerequisite: Spanish 97 or permission of the instructor. 3 s.h. (E) CASTELLANO

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified juniors by permission of the Department. See page 38. 6 s.h.

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified seniors by permission of the Department. See page 38. 6-12 s.h.

251. THE ORIGINS OF THE SPANISH NOVEL.—A critical study, based on close readings and discussions, of selected examples of the principal genres of the early novel: *Amadis de Gaula,* Diego de San Pedro's *La cárcel de amor,* the *Abencerraje,* the *Lazarillo,* Montemayor's *Diana.* 3 s.h. (W) WARDROPPER

252. SPANISH LYRIC POETRY BEFORE 1700.—A critical study, based on close reading and discussion, of selected poems of the Middle Ages, Renaissance and Baroque. Special emphasis on the *Razón de amor, la poesía de tipo tradicional,*

and Santillana; on Garcilaso, San Juan de la Cruz, Fray Luis de León, and Herrera; on Góngora and Quevedo. 3 s.h. (w) WARDROPPER

253. THE ORIGINS OF THE SPANISH THEATER.—A study of the evolution of the Spanish theater from the *Auto de los Reyes Magos* (12th century) through the end of the 16th century. The idea of the theater as dramatic poetry will be stressed; close reading of texts by Gómez Manrique, Encina, Gil Vicente, Torres, Naharro, Lope de Rueda, Juan de la Cueva. 3 s.h. (w) WARDROPPER

255. MODERN LATIN AMERICAN LITERATURE.—The coming of age of Latin American literature in the nineteenth and twentieth centuries, with particular attention to the Modernist movement. 3 s.h. (w) FEIN

256. CONTEMPORARY LATIN AMERICAN LITERATURE.—Trends in Latin American literature after the Modernist movement. Analysis of significant works in various genres. 3 s.h. (w) FEIN

258. OLD SPANISH LITERATURE.—An introduction to the reading of medieval Spanish literary texts. 3 s.h. (w) DAVIS

259. SPANISH PHONETICS.—A phonemic approach to the study of Spanish sounds. Remedial pronunciation drills with special emphasis on rhythm and intonation. Readings in current studies of phonology. Prerequisite: Spanish 176 or permission. 3 s.h. (E) CASTELLANO

260. ADVANCED COMPOSITION AND SYNTAX.—Study of fundamental difficulties in the language; practice in writing idiomatic Spanish; exercises in free composition. For students who have a satisfactory command of Spanish grammar and fair conversational ability. Prerequisites: Spanish 176 or permission. 3 s.h. (E) CASTELLANO

261. NINETEENTH CENTURY NOVEL.—A study of literary and social trends in the last half of the nineteenth century. Readings will be selected from the novels of Valera, Pereda, Galdós, Pardo, Bazán, Blasco Ibáñez, and their contemporaries. 3 s.h. (w) DAVIS

264. MODERN AND CONTEMPORARY SPANISH THEATRE.—A brief review of the modern and contemporary Spanish theatre from the period of Romanticism. Lectures, reading, and discussion of the most representative works of Benavente, Martínez Sierra, los hermanos Quintero, etc. 3 s.h. (E) CASTELLANO

265. GOLDEN AGE LITERATURE: CERVANTES.—The life and thought of Cervantes with special emphasis on his *Quijote*. 3 s.h. (w) PREDMORE

266. GOLDEN AGE LITERATURE: THE DRAMA.—A study of the chief Spanish dramatists of the seventeenth century with readings of representative plays of this period. 3 s.h. (w) CASTELLANO

275. CONTEMPORARY SPANISH LITERATURE: ESSAY AND LYRIC POETRY.—A study of the revision of national values and literary expression in the twentieth century with particular reference to the crisis of 1898 and to the enrichment of the Spanish tradition through extrapeninsular influences. 3 s.h. (w) PREDMORE

276. CONTEMPORARY SPANISH LITERATURE: NOVEL.—A study of tradition and innovation in the twentieth century Spanish novel with emphasis on the novels of Unamuno, Baroja, Valle Inclán, and Pérez de Ayala. 3 s.h. (w) PREDMORE

ROMANCE LANGUAGES

RL 211. APPROACHES TO ROMANCE LITERATURE.—An introduction to the most significant ways in which Romance Literature has been divided and studied, with analyses of selected texts. 3 s.h. (w) CHERPACK

RL 218. THE TEACHING OF ROMANCE LANGUAGES.—Evaluation of objectives and methods; a study of the practical problems involved in teaching these languages on the elementary, secondary, and college level; analysis of textbooks, special foreign language programs, audio-visual aids; critical examination of modern techniques in written and oral testing. 3 s.h. (E) DOW

RL 224. ROMANCE LINGUISTICS.—The origin and development of the Ro-

mance languages from spoken Latin to the modern standard languages and local dialects. Introduction to the structural method as applied to historical and comparative linguistics. Prerequisite: French 219, Spanish 258, or permission of instructor. 3 s.h. (w) HULL

DEPARTMENTAL MAJOR

Prerequisites: French or Spanish: 63-64 or equivalent.
Major Requirements: For French:

1) 97
2) 127 or 128
3) 209 or 210
4) A minimum of 15 hours of courses in literature (91 and above) including six hours above 200. All majors must take one of the following: 113, 213, 214.

For Spanish:
1) 97
2) 176
3) 259 or 260
4) A minimum of 15 hours of courses in literature (91 and above) including six hours above 200. All majors must take one of the following: 161, 251, 252, 253, 265, 266.

The Department offers work in the junior and senior years leading to graduation with distinction. See the section on Honors in this *Bulletin*.

RELATED WORK

Majors in Romance Languages will select, with approval of the Director of Undergraduate Studies, appropriate courses from the following fields: (1) other languages and literature; (2) history; (3) philosophy; (4) appreciation courses in music and art; (5) linguistics; and occasionally from other fields deemed suitable.

RUSSIAN

ASSOCIATE PROFESSOR JEZIERSKI; ASSISTANT PROFESSORS M. PAVLOV, H. PAVLOV, MR. DUDA; SWAN AND MISS SALVÉ

1-2. ELEMENTARY RUSSIAN.—Introduction to understanding, speaking, reading and writing. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (w) STAFF

63-64. INTERMEDIATE RUSSIAN.—Intensive classroom and laboratory practice in spoken and written patterns. Reading in contemporary literature. Prerequisite: Russian 1-2, or two years of high school Russian. 8 s.h. STAFF

91-92. ADVANCED RUSSIAN.—Systematic study of syntax and style in the written and spoken language. Readings of nineteenth and twentieth century authors. Oral and written reports. Conducted in Russian. Prerequisite: Russian 63-64, or equivalent. 6 s.h. (w) PAVLOV

97, 98. SPOKEN RUSSIAN.—Intensive instruction in the spoken language: contemporary Russian prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: Russian 92. 3 s.h. M. PAVLOV

101, 102. RUSSIAN LITERATURE AND CULTURE THROUGH THE NINETEENTH CENTURY.—Russian prose, poetry and criticism, with special attention to recent periods. Readings (from *The Igor Tale* to Blok) in English. Lectures and class discussion. 6 s.h. (w) JEZIERSKI

103. SOVIET LITERATURE AND CULTURE.—Literature since 1917, as a continuation of nineteenth-century traditions and as a response to Soviet ideology. Readings (in English or Russian) from major works of prose, poetry and drama. 3 s.h. (w) JEZIERSKI

105. THE RUSSIAN THEATRE AND DRAMA.—Russian drama from its beginnings to contemporary practice. Lectures, class, discussions, readings of plays (Pushkin to Majakovskij) in English or Russian. 3 s.h. (w) JEZIERSKI

112. PUSHKIN AND THE BIRTH OF RUSSIAN REALISM.—An intensive study of the works of Russia's greatest poet. Readings in English or Russian. Prerequisite: Russian 101 or instructor's consent. 3 s.h. (w)

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students by permission of the department. (See page 38.) 6 s.h.

201, 202. THE NOVELISTS OF NINETEENTH CENTURY RUSSIA.—Development of the Russian novel against the European background, with emphasis on Dostoevskij and Tolstoj. Extensive readings in English or Russian. Lectures, oral reports, class discussions and term paper. 6 s.h. (w) Jezierski

DEPARTMENTAL MAJOR

Prerequisite: Russian 1-2

Major Requirements: Russian 63-64 and 18 semester hours in the department including 91-92 and at least 6 semester hours of senior-graduate courses.

Related Work: 18 semester hours chosen with the approval of the department from the humanities, history and the social sciences.

SOCIOLOGY AND ANTHROPOLOGY

PROFESSOR MCKINNEY, CHAIRMAN; ASSOCIATE PROFESSOR ROY, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BACK, KERCKHOFF, LABARRE, MADDOX, AND THOMPSON; ASSOCIATE PROFESSORS MCCORMACK, PREISS, ROWE, SMITH, AND TIRYAKIAN; ASSISTANT PROFESSORS FARLEY AND WINSBOROUGH

Sociology 91 or 92, or the equivalent or special permission of the instructor or of the Director of Undergraduate Studies, is a prerequisite for all courses at the 100 and 200 levels, except 131, 132, 133, 230, 232, 234, and 236.

91. INTRODUCTION TO SOCIOLOGY: CONCEPTS AND PROCEDURES.—Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. 3 s.h. (E & W) Open to Freshmen. Staff

92. INTRODUCTION TO SOCIOLOGY: SOCIOLOGICAL STUDIES.—Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 3 s.h. Open to Freshmen. (E & W) Staff

93. GENERAL ANTHROPOLOGY.—Origins and distribution of mankind; a survey of human palaeontology and human biology, world archaeology, prehistory and languages; and the origins of the family, primitive economics, arts, social and political organization. Special attention is given to primitive people. 3 s.h. (w) Staff

94. CULTURAL ANTHROPOLOGY.—A study of the dynamics of culture, the causal factors, functions, integration and disintegration, diffusion, growth and change of cultures. Emphasis is upon the simpler societies. 3 s.h. (w) Staff

130. CULTURAL CHANGE AND STABILITY.—Contemporary theories of culture change, especially those resulting from acculturation and from implementation of programs of technical and economic aid; a consideration of the factors significant in maintaining stability or stimulating change in traditional cultures. 3 s.h. (w) Rowe

131. PEOPLES OF THE WORLD: AMERICAN INDIAN.—A comprehensive survey of the Indians of North and South America, including a study of origins and prehistory, archaeology, physical anthropology, languages, material culture, social and political organization, economics and religion, discussed in terms of the "culture area" concept. 3 s.h. (w) LaBarre

132. PEOPLES OF THE WORLD: AFRICA AND OCEANIA.—A comprehensive survey of the non-European peoples of Africa and Oceania, covering available prehistory, archaeology, racial affiliations, languages, material culture, social and political organization, economics and religion, discussed in terms of the "culture area" concept. 3 s.h. (w) LaBarre

133. PEOPLES OF THE WORLD: ASIA.—A comprehensive survey focusing on the peoples and societies of South, Southeast and East Asia, including the pre-

historic, ethnic, linguistic, religious and political foundations of the complex civilizations; the response of traditional Indian, Chinese and Japanese cultures to the West. 3 s.h. (w) McCORMICK AND ROWE

137. COMPARATIVE SOCIAL STRUCTURES.—Social anthropological analysis of role structures and corporate groups in particular societies, and their relevance for understanding the historic process of civilization. Case study of social types and of the unique features of societies revealed by the comparative method. 3 s.h. (w) McCORMACK

141. INTRODUCTION TO POPULATION AND HUMAN ECOLOGY.—This course provides an introduction to two macroscopic aspects of society. Both the size, distribution and composition of populations, and the morphological aspects of collective life are considered. 3 s.h. (w) WINSBOROUGH AND FARLEY

142. THE SOCIOLOGY OF MASS COMMUNICATION.—An analysis of the role of radio, the press, magazines, movies and television in modern societies. An examination of the selective audiences, content characteristics, controlling elements, and organizational structure of the various media of mass communication. 3 s.h. (w) SMITH

145. URBAN SOCIOLOGY.—Using historical, demographic, and ecological materials for background, urban society is studied with respect to its institutions, interactional patterns, differentiation, integration, disorganization, and decentralization. 3 s.h. (w) SMITH AND FARLEY

146. INDUSTRY AND SOCIETY.—A study of industrial institutions in their interrelationships with other forms of social behavior in the broad cultural setting of western civilization. Attention will center upon analysis of specific social problems resulting from the impact of industrial change. 3 s.h. (w) ROY

150. THE FAMILY.—Analysis of the American family as an institutionalized group and its relationship with other institutions and structural features such as social class and ethnic group. Special attention is devoted to methods of research in this area. 3 s.h. (w) KERCKHOFF

153. SOCIOLOGY OF THE SOUTH.—The developing regional organization of the world economy studied with especial reference to Southern life. A survey of the composition and distribution of population, races and race relations. Primary emphasis is upon social change. 3 s.h. (w) THOMPSON

154. THE SOCIOLOGY OF THE ARTS.—An analysis of the social relations of the world of the arts (painting and sculpture, music, and literature) with emphasis upon creative artists, art publics, art organizations and art works as they function in their social-cultural milieux. 3 s.h. (w) STAFF

155. INTRODUCTION TO INDUSTRIAL SOCIOLOGY.—An analysis and appraisal of the various factors that affect human relations in industry. The interpersonal and intergroup relationships within the individual industrial unit which determine its efficiency as an economic and social institution and the social conditions in the community as they affect social relations. 3 s.h. (w) ROY

159. THE NEGRO IN AMERICA.—A study of the history and changing status of the Negro regarded as a symbol and protagonist of minority groups in America and elsewhere. 3 s.h. (w) THOMPSON

172. COLLECTIVE BEHAVIOR AND SOCIAL MOVEMENTS.—Examination of disruptive and relatively unorganized aspects of social phenomena such as crowd behavior, fads, rumors, crazes and social movements as indexes of social disequilibrium and potential sources of social change. 3 s.h. (w) KERCKHOFF

199. INDEPENDENT STUDY.—Directed reading and research. Required of candidates for graduation with distinction in the department. Open only to highly qualified students in the senior year, by permission of the department. 3 s.h. (w) STAFF

230. SOCIETY AND CULTURE IN INDIA.—The basic features of Indian cultures and societies from an anthropological perspective. The impact of selected technological and social changes upon the individual, caste, and community. 3 s.h. (w) ROWE AND McCORMACK

232. PRIMITIVE RELIGION.—The ethnography, the social functions, and the sociopsychological meanings of religion in primitive societies. 3 s.h. (w) LABARRE

234. PERSONALITY AND SOCIETY.—The sociology and social psychology of human personality, its origins in the primary group, its nature and varieties and its integrations into secondary group institutions. 3 s.h. (w) LABARRE

236. PERSONALITY AND CULTURE.—The influence of culture patterns and social institutions upon character structure, socialization of the individual, and the dynamics of human personality. Comparative anthropological materials will be drawn upon. Prerequisite: Course 234. 3 s.h. (w) LABARRE

238. LANGUAGE AND SOCIETY.—Universal features of language; language as a mirror of society and social perception through language; language as a coding system; linguistics and anthropology; applied linguistics. 3 s.h. (w) MCCORMACK

241. SOCIAL STRATIFICATION.—The nature of hierarchical and vertical differentiation in the economic, political, and prestige structures in modern societies. The interrelationship of class, status, and power strata and their influence on social institutions, personality structure, and group and individual behavior. 3 s.h. (w) ROY

242. THE SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS.—The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 3 s.h. (w) MCKINNEY

245. DEVIANT SOCIAL BEHAVIOR.—Analysis of deviant behavioral systems (illness, crime, delinquency, etc.) in terms of a) precipitating social factors, b) patterns and goals, c) remedial and counter-acting controls. 3 s.h. (w) PREISS

247. COMMUNITY AND SOCIETY.—This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, and news, mass behavior, social problems, races, and classes. 3 s.h. (w) THOMPSON

253. SOCIAL INSTITUTIONS.—The study of particular institutions and the social movements out of which they developed, with emphasis on the development of general propositions concerning the nature, function, and importance of institutions in society. 3 s.h. (w) THOMPSON

255. RACE AND CULTURE.—A comparative study of race relations in world perspective developed around such themes as race and personal identity, the geography and ecology of race relations, the idea of race, and race conflict. 3 s.h. (w) THOMPSON

272. THE SOCIALIZATION PROCESS.—Universal societal requirement for continual replacement of socialized personnel. Variations in socialization by position in the social structure (class, caste, urban-rural, etc.) and contribution made by various socialization agencies (family, school, peer groups, mass media). Western society is focus of study. 3 s.h. (w) KERCKHOFF

275. SOCIAL ATTITUDES AND INDIVIDUAL BEHAVIOR.—The importance of symbolic interaction, the development of the "self," individual movement within the social structure, and the importance of membership groups and reference groups. 3 s.h. (w) KERCKHOFF AND BACK

278. SOCIAL STRUCTURE AND THE LIFE CYCLE.—A study of the relationship between age as a social characteristic and social interaction, with particular reference to adolescence and old age. 3 s.h. (w) MADDOX

281. DEVELOPMENT OF SOCIOLOGICAL THEORY.—An analysis of the development, convergence, and utilization of sociological theory. Prerequisite: 15 s.h. credit in sociology. 3 s.h. (w) MCKINNEY, TIRYAKIAN AND PREISS

295. METHODOLOGY IN SOCIOLOGY.—Considerations of the nature of scientific method, as well as alternative paths to knowledge, as they apply to sociology. Conceptualization, hypothesis formation, and definition. The research process as a decision-making situation both on the general level of research design and the specific level of special techniques. The process and logic of data analysis. Relations of theory and research are stressed. 3 units. SMITH AND BACK

297. STATISTICAL ANALYSIS IN SOCIOLOGY.—Such techniques as zero and higher order linear and curvilinear correlation, partial correlation, analysis of variance, and covariance and factorial design are studied. When possible, analogous non-parametric techniques are also considered. Undergraduates must have at least 15 s.h. and a B average in sociology and obtain the permission of the instructor. 3 s.h. (w) WINSBOROUGH AND FARLEY

DEPARTMENTAL MAJOR

Senior-Graduate courses.

Major Requirements: Twenty-four semester hours of work in the Department including either or both Sociology 91 and 92 and at least six semester hours in the Senior-Graduate courses.

Related Work: A minimum of eighteen semester hours, at least twelve of which are normally chosen from two of the following fields: economics, education, history, political science, and psychology. Additional courses in other fields may also be elected as related work when indicated by the educational requirements of the student and approved by the Departmental adviser.

SPANISH

For courses in Spanish, see *Romance Languages,* p. 128.

UNIVERSITY COURSES

FALL SEMESTER

199.1 THE IMPACT ON OUR SOCIETY AND CULTURE OF MODERN SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT.—PAUL M. GROSS

199.2 THE ARTS AT MID-CENTURY.—IAIN HAMILTON

199.3 PHILOSOPHY OF RESEARCH IN THE BIOLOGICAL SCIENCES.—DAVID T. SMITH

199.4 THE EUROPEAN THEATRE OF THE RENAISSANCE AND THE BAROQUE.—BRUCE W. WARDROPPER

SPRING SEMESTER

199.5 AMERICA IN PERSPECTIVE.—JOHN R. ALDEN

199.6 LEGAL REASONING.—BRAINARD CURRIE

199.7 THE MAJOR QUESTIONS OF BIOCHEMISTRY.—PHILIP HANDLER

ZOOLOGY

PROFESSOR HORN, CHAIRMAN; ASSOCIATE PROFESSOR BAILEY, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BOOKHOUT, GRAY, GREGG, MENZIES, SCHMIDT-NIELSEN, WILBUR; VISITING PROFESSOR HUGHES-SCHRADER; ADJUNCT PROFESSOR STEFÁNSSON; ASSOCIATE PROFESSORS FLUKE, HUNTER, KLOPFER, LIVINGSTONE, VERNBERG, WAINWRIGHT, AND WARD; ASSISTANT PROFESSORS COSTLOW, COURTENAY, AND TUCKER; INSTRUCTORS ANDERSON, BEATTY, AND STRUHSAKER

1. ANIMAL BIOLOGY.—The principles of biology as applied to animals. 4 s.h. (E & W) KLOPFER AND STAFF

2. GENERAL ZOOLOGY.—A survey of the animal kingdom. Prerequisite: Zoology 1. 4 s.h. (E & W) BOOKHOUT, MRS. HUNTER, AND STAFF

53. COMPARATIVE VERTEBRATE ANATOMY.—A study of the anatomy and evolution of the organ systems of vertebrates. Prerequisites: Zoology 1, 2. 4 s.h. (W) HORN AND STAFF

71. HEREDITY AND EUGENICS.—Effects of environment and heredity upon the individual and populations; interpretation of human genetic histories. Prerequisite: one year of zoology. 3 s.h. (W) WARD

92. GENERAL EMBRYOLOGY.—An introduction to the study of developmental processes. Prerequisite: Zoology 1, 2. Recommended Zoology 53. 4 s.h. (w)
GREGG AND STAFF

103. PRINCIPLES OF ECOLOGY.—An introduction to the study of organisms in natural habitats, with particular attention to the growth of animal populations, the chemical role of organisms, energy flow through food chains, and the development of ecological systems through geologic time. Prerequisites: Botany 1, 2 or Zoology 1, 2; Mathematics 17 or 21. 4 s.h. (w) LIVINGSTONE

109. EVOLUTION.—Analysis of the processes of adaptation and evolution in individuals, populations, and genetic systems. Lectures and student reports. Prerequisite: Genetics or consent of the instructor. 3 s.h. (w) KLOPFER

110. INTRODUCTION TO GENETICS.—The principles and practical application of genetics. Prerequisite: one year of zoology or consent of instructor. 3 s.h. With laboratory—4 s.h. (w) WARD

120. ORNITHOLOGY.—Lectures, laboratory and field trips dealing with the classification, adaptations, and natural history of birds. Prerequisite: one year of zoology. Zoology 53 recommended. 4 s.h. (w) BAILEY

146. PHYSICAL BIOLOGY.—Physical principles of structure and function in large biological molecules and aggregates, applications to heredity, to function at higher levels of organization, and to biological fitness and accommodation. Prerequisites: Mathematics 22, Chemistry 151, and Physics 41 (or equivalents), one and one-half years of college biology, or consent of the instructors. 4 s.h. (w)
FLUKE AND WAINWRIGHT

148. ELEMENTARY BIOCHEMISTRY.—The chemistry of proteins, lipids, carbohydrates and nucleic acids and the metabolic interrelationships of these compounds. Subjects of special interest to biologists, including photosynthesis, chemical genetics, vision, nutrition and the chemical basis of muscle and nerve function. Prerequisites: Chemistry 151, one year of college physics (second semester may be concurrent), Mathematics 22, or consent of the instructor. 3 s.h. (w)
R. HILL, FRIDOVICH AND STAFF

151. PRINCIPLES OF PHYSIOLOGY.—An introductory survey of physiological functions. Prerequisites: At least a year of zoology and a year of chemistry. 4 s.h. (w) TUCKER

156. VERTEBRATE HISTOLOGY.—The microscopic structure of normal tissues and organs of the vertebrate body. Training will be given in the preparation of material for microscopic study. Prerequisite: Open only to juniors and seniors who have completed two years of zoology. 4 s.h. (w)

161. ANIMAL PARASITES.—An introductory course dealing with biological principles involved in parasitism of animals including man. Prerequisite: one year of zoology. 4 s.h. (w) MRS. HUNTER

196. SEMINAR.—Open to junior and senior departmental majors. 2 s.h. (w)
STAFF

197, 198. SPECIAL PROBLEMS.—Senior and Junior majors who have had proper training may be permitted to carry on special work. Permission must be obtained from the Director of Undergraduate Studies and the instructor under whom the student wishes to work. Not more than 4 s.h. may be counted toward major work. (w) STAFF

FOR SENIORS AND GRADUATES

201. ANIMAL BEHAVIOR.—A review of the major developments in the field with emphasis on recent physiological and developmental studies. Prerequisites: physiology, genetics and evolution, or consent of instructor. 3 s.h.; 4 s.h. with laboratory. (w) KLOPFER

203. ECOLOGY.—Relation of animals to environment. Lectures, readings, reports, conferences; laboratory and field work. 4 s.h. (w) GRAY

210. EXPERIMENTAL GENETICS.—The relationship of phenotype to genome and environment; cytogenetics, recent research in the field of genetics. Prerequi-

sites: Principles of heredity (one of the following: Zoology 110, Botany 101, 202, or equivalent), or consent of instructor. 4 s.h. (w) WARD

214. BIOLOGICAL OCEANOGRAPHY.—Composition in time and space of marine biosphere in relation to descriptive marine chemistry, physics, and geology. Some work at sea aboard the research vessel. Prerequisites: A course in invertebrate zoology, ecology, marine biology or an appropriate equivalent; chemistry through organic; one year of physics and mathematics. 4 s.h. (Given at Beaufort only.) MENZIES

215. GENERAL PHYSICAL AND CHEMICAL OCEANOGRAPHY.—Relief of the ocean floor; physical and chemical properties of sea water; distribution of temperature, salinity and density; heat budget; sea ice; light; ocean currents, waves and tides; selected topics of regional oceanography. Prerequisites: One year each of physics and chemistry, Mathematics 22 or equivalent. 6 s.h. (Given at Beaufort only.) STEFÁNSSON

216. LIMNOLOGY.—A study of lakes, ponds and streams, including their origin, development, geochemistry, energy balance, productivity, and the dynamics of plant and animal communities living in them. Lectures, field trips, and laboratory work. Usually offered in alternate years. Prerequisites: one year each of biology, chemistry and physics, and Mathematics 21; or permission of instructor. 4 s.h. (w) LIVINGSTONE

222. ENTOMOLOGY.—Anatomy, physiology, embryology, and classification of insects. Prerequisite: One year of zoology. 4 s.h. (w) GRAY

224. VERTEBRATE ZOOLOGY.—A study of life histories, adaptations, ecology, and classification of vertebrate animals. Prerequisite: Zoology 53. 4 s.h. (w) BAILEY

228. EXPERIMENTAL EMBRYOLOGY.—Lectures, readings, reports, and laboratory work. 4 s.h. GREGG

238. SYSTEMATIC ZOOLOGY.—The fundamental theory and practice involved in the collection, identification, and classification of animals. Prerequisites: Zoology 1, 2. 4 s.h. (w) BAILEY

243. CYTOLOGY.—The structure of the cell. Lectures, readings, reports, and laboratory work. Prerequisites: Zoology 53, 92, 156 or equivalent and consent of instructor. (Combined course with Botany 203.) 4 s.h.

245. RADIATION BIOLOGY.—Actions of ionizing and excitational radiations on life processes: a survey and an adventure in biophysics. Prerequisites: College physics, mathematics and organic chemistry. 3 s.h., or 4 s.h. with laboratory (w) FLUKE

246. MOLECULAR BIOLOGY.—The nature, functional relationships, and replication of biological structure at the molecular level. Laboratory projects optional by arrangement. Prerequisites: College physics, mathematics, and organic chemistry. Biochemical and genetic background are suggested. 3 s.h., or 4 s.h. with instructor's advance approval of laboratory work. (w) FLUKE

247. BIOLOGICAL NUCLEONICS.—Laboratory instruction in biological uses of radioactive tracers, in counting instruments and measurements, and in legal requirements. Prerequisites: By consent of instructor and normally two years of biology and one year of college chemistry. 2 s.h. (w) FLUKE

250. PHYSIOLOGICAL ECOLOGY OF MARINE ANIMALS.—A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla and from various habitats are studied. Prerequisite: Zoology 151 or equivalent. 6 s.h. (Given at Beaufort only.) VERNBERG

252. COMPARATIVE PHYSIOLOGY.—The physiological mechanisms of animals studied on a comparative basis. Prerequisite: Zoology 151 or equivalent. 4 s.h. (w) K. SCHMIDT-NIELSEN

271. CELLULAR PHYSIOLOGY.—The physiological processes of living matter approached through studies of cells. Prerequisites: Two years of biology and at least one year of chemistry. 4 s.h. (w) WILBUR

274. INVERTEBRATE ZOOLOGY.—A study of structure, functions, and habits of invertebrate animals under normal and experimental conditions. Field trips will be made to study, collect, and classify animals in their natural habitats. Prerequisites: Zoology 1, 2. 4 s.h. (w) BOOKHOUT

276. PROTOZOOLOGY.—The morphology, physiology, taxonomy, and culture of protozoa. Prerequisites: Zoology 1, 2. 4 s.h. (w) BOOKHOUT

278. INVERTEBRATE EMBRYOLOGY.—Lectures, readings and laboratory work dealing with rearing, development, and life history of invertebrates. Prerequisite: Zoology 92. 4 s.h. (w) BOOKHOUT

MARINE LABORATORY. The following courses are given at Duke University Marine Laboratory, Beaufort, N. C.: 203, Marine Ecology; 214, Biological Oceanography; 215, General Physical and Chemical Oceanography; 250, Physiological Ecology of Marine Animals; 274, Marine Invertebrate Zoology. Consult the announcement of the Duke University Marine Laboratory.

DEPARTMENTAL MAJOR

Prerequisites: Zoology 1 and 2.

Major Requirements (for both A.B. and B.S. degrees): A minimum of 24 s.h. of zoology including at least one course in each of the following three areas: morphology (53, 92, 156, or 278), physiology (151 or 271), and genetics (71 or 110).

With the prior approval of the Director of Undergraduate Studies, up to 6 s.h. of advanced work in the natural and formal sciences, other than zoology, may be counted toward the 24 s.h. of the zoology major.

Related Work:

A.B. Degree: Related work will include at least one year of chemistry with additional work usually chosen from courses in botany, chemistry, geology, mathematics, or physics. The language requirement will preferably be met by French, German, or Russian.

B.S. Degree: Related work will include Chemistry 151 and 152 with additional work chosen from courses in botany, geology, mathematics or physics. Language requirements may be met by two languages, chosen from German, French, or Russian.

The Department offers work leading to graduation with distinction. See the section on Honors.

College of Engineering

CIVIL ENGINEERING

PROFESSOR BROWN, CHAIRMAN AND DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BRYAN, VESIĆ, AND WILLIAMS; ASSOCIATE PROFESSORS HAINES AND PALMER; ASSISTANT PROFESSORS ARGES, BARTON, HARRAWOOD, HILL, HOLLAND, AND WOOD; VISITING ASSOCIATE PROFESSOR KUMAR; MESSRS. RAJAN AND SHEPPARD

CE 61. PLANE SURVEYING.—Use and adjustment of instruments; transit-tape, stadia, and plane table surveying; differential and profile leveling; calculation of bearings, latitudes, departures, and areas; accuracy and errors; topographic mapping; rural and urban land surveys; celestial observations for azimuth; triangulation; introduction to photogrammetry. Prerequisites: Engrg. 1 and Math 21. 5 s.h. (w) SHEPPARD

CE 72. MATERIALS LABORATORY.—Blending of granular materials and determination of their physical properties, design of concrete and bituminous mixtures, consistency limits of soils. 1 s.h. (w) HOLLAND

CE 101. SOIL MECHANICS LABORATORY.—Soil exploration and sampling. Laboratory determination of index properties: water content, void ratio, particle size, Atterberg limits. Consolidation testing. Triaxial shear testing. Classification and identification of soils. Compaction testing. Demonstrations of seepage, bearing capacity and earth pressure phenomena. Concurrent: CE 135. 1 s.h. (w) HOLLAND AND VESIĆ

CE 110. *PLANE SURVEYING.—Use and adjustment of instruments; transit-tape, stadia, and plane table surveying; differential and profile leveling; calculation of bearings, latitudes, departures, and areas; accuracy and errors. Prerequisites: Engrg. 1 and Math 21. 3 s.h. (w) ARGES

CE 113. ROUTE SURVEYING.—Simple, compound and reverse curves; spirals; earthwork and grading plans. Prerequisite: CE 61. 2 s.h. (w) SHEPPARD

CE 116. TRANSPORTATION ENGINEERING.—Location, design, construction and maintenance of highways and city streets; soil stabilization; traffic studies; economics of planning and design. Prerequisite: CE 113 and 135. 3 s.h. (w) HOLLAND

CE 118. MATERIALS OF ENGINEERING.—Behavior of materials under load; mechanical properties as criteria for failure; elementary metallurgy. Ferrous and non-ferrous metals and non-metalic materials. Prerequisites: Engrg. 107 and 109 2 s.h. (w) PEARSALL

CE 121. *HYDROLOGY.—Fundamentals of meteorology; precipitation; evaporation. Ground water development. Stream flow and stream gaging. Hydrograph analysis. Flood routing. Field trips to be arranged. Prerequisite: Engrg. 128. 3 s.h. (w) WILLIAMS

CE 123. HYDRAULIC ENGINEERING.—Pipe flow, compound pipe systems, network analysis, analysis and problems on pumps and turbines, fundamental aspects of hydrology. Open channel flow, non-uniform flow computations. Irrigation and drainage problems. Flood control and hydraulic structures. Prerequisite: Engrg. 128. 3 s.h. (w) HARRAWOOD

CE 124. FUNDAMENTALS OF SANITARY ENGINEERING.—Engineering and public health aspects of water treatment and supply, waste treatment and disposal, and environmental sanitation. Design basis for collection and treatment facilities.

* Offered only upon sufficient demand; enrollment limited.

Laboratory procedures and interpretation of results. Prerequisites: Chemistry 2 and CE 123. 3 s.h. (w) BRYAN

CE 126. *SANITARY ENGINEERING DESIGN.—Design of facilities for providing an adequate supply of water and means for treatment and disposal of wastes. Stream sanitation as it affects location and design of treatment works. Prerequisite: CE 124. 3 s.h. (w) BRYAN

CE 131. STRUCTURAL MECHANICS I.—Shears, moments, and internal forces by algebraic and graphic methods under various conditions of loading. Deflection of trusses. Prerequisite: Engrg. 107. 3 s.h. (w) BROWN

CE 132. STRUCTURAL DESIGN.—Tension, compression, flexural members, eccentric connections, unsymmetrical bending, riveted and welded plate girders, trusses and office building frames. Timber design using ring connectors. Design and detail drawings. Prerequisite: CE 131. 4 s.h. (w) PALMER

CE 133. REINFORCED CONCRETE.—Theory and design of reinforced concrete beams, columns and footings. Moment distribution. Prerequisite: CE 131. 3 s.h. (w) PALMER

CE 135. INTRODUCTION TO SOIL MECHANICS.—Origin and composition of soils, soil structure. Flow of water through soils, capillary and osmotic phenomena. Soil behavior under stress; compressibility, shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes. Prerequisites: Engrg. 107, 109, and 128; concurrent: CE 101. 2 s.h. (w) VESIĆ

CE 140. STRUCTURAL MECHANICS II.—Analysis of statically indeterminate structures by various methods including those of elastic energy. Prerequisite: CE 3. 3 s.h. (w) BARTON

CE 143, 144. *PROJECTS IN CIVIL ENGINEERING.—This course may be assigned by the Chairman of the Department to certain seniors who have shown an aptitude for research, in which case it may be substituted for certain civil engineering courses. 3-6 s.h. (w) STAFF

CE 146. PROFESSIONAL ENGINEERING.—Topics related to the practice of civil engineering: engineering economy, contracts, specifications, and ethics. Presentation of student papers on historical and current aspects of civil engineering. Seniors only. 2 s.h. (w) PALMER

CE 148. *STRUCTURAL ENGINEERING.—Structural design utilizing metals, concrete and timber. Planning, preliminary design, organization of design procedures and specifications. Prerequisites: CE 132 and CE 133. 3 s.h. (w) PALMER

CE 154. *GEOMETRIC THOROUGHFARE DESIGN.—Analysis and design of municipal street systems. Origin-destination surveys; control of traffic flow; grade, rotary, and grade-separation intersections. Prerequisite: CE 113. 3 s.h. (w) WILLIAMS

CE 201. *ADVANCED MECHANICS OF MATERIALS.—Analysis of structural elements described by ordinary differential equations, such as beams on an elastic foundation, curved beams, beam-columns, circular plates; introduction to plates and shells; energy principles and their use in structural analysis. 3 units. (w) HILL

CE 202. *EXPERIMENTAL STRESS ANALYSIS.—The experimental analysis of stress and strain in deformable bodies, correlation of theory with data from experiments; photoelasticity; strain gages; dimensional analysis and similitude principles of models. 3 units. (w) HILL

CE 205. *APPLIED ELASTICITY.—Introduction to linear theory of elasticity; solutions of two-dimensional problems; three-dimensional problems of torsion and bending; stress concentrations; energy and variational principles with applications to design. 3 units. (w) HILL AND MERIAM

CE 211. *MECHANICAL BEHAVIOR OF MATERIALS.—Macroscopic mechanical properties of materials for static, fatigue, dynamic and creep conditions; impact, shock, and stress wave properties; temperature, creep, viscoelastic and relaxation properties. 3 units. (w) KUMAR

CE 221. *INCOMPRESSIBLE FLUID FLOW.—Steady and unsteady pipe flow,

theories of turbulent flow; water hammer theory and control; surge tanks; air chambers; the analysis and control of fluid systems; effect of resistance; tapered conductors. 3 units. (w) HARRAWOOD AND WOOD

CE 231. *STRUCTURAL ENGINEERING.—The application of the fundamental theories of structural action to the design and analysis of structural members; specifications. 3 units. (w) BARTON

CE 232. *REINFORCED CONCRETE DESIGN.—Design and analysis of reinforced concrete members including the influence of shrinkage and plastic flow; bond and diagonal tension; prestressed concrete members. 3 units. (w) BROWN

CE 235. *FOUNDATION ENGINEERING.—An introduction to methods of analysis, design and construction of foundations. Bearing capacity and settlement of shallow and deep foundations. Soil exploration; excavation and bracing; drainage and stabilization; underpinning. Foundation vibrations. 3 units. (w) VESIĆ

CE 243, 244. *SANITARY ENGINEERING UNIT OPERATIONS AND PROCESS DESIGN.—Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and bio-treatment processes. 6 units. (w) BRYAN

CE 250. *ENGINEERING ANALYSIS.—General concepts of the solutions of engineering problems with special emphasis on digital and analog computer and numerical methods; deflection and stability; torsion of noncircular beams and multicelled thin-walled structures; vibrations of beams and membranes; structures with both uniform and nonuniform properties and with rigid and nonrigid supports. 3 units. (w) WOOD

The Department offers work leading to graduation with distinction. See the section on Honors.

ELECTRICAL ENGINEERING

PROFESSOR WILSON, CHAIRMAN; PROFESSOR MEIER, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS OWEN AND VAIL; VISITING PROFESSOR KRAUSS; ASSOCIATE PROFESSORS ARTLEY AND KRAYBILL; ADJUNCT ASSOCIATE PROFESSOR BURGER; ASSISTANT PROFESSORS GEORGE AND PILKINGTON; LECTURERS JENKINS, OLIVE, AND WORTMAN; VISITING LECTURER WELLS; INSTRUCTORS ABSHER, BARNES, AND PALMER; MESSRS. BUMGARDNER, FENG, FREKKO, JONES, OWSLEY, AND ROE

EE 53. ELECTRICAL ENGINEERING FUNDAMENTALS.—Survey of electrical engineering profession: role of engineering and professional engineering societies in national life; engineering economy; engineering law; technical engineering problems; basic philosophy of engineering education; introduction to staff, curriculum, and facilities of Department of Electrical Engineering. One two-hour session. 1 s.h. (w) KRAYBILL AND PILKINGTON

EE 55. ELECTRIC NETWORKS I.—Physical nature of circuit parameters and sources of excitation; volt-ampere relations for circuit elements; network topology; network equations using loop currents and node voltages; solutions of network differential equations by classical and transform methods. Concurrent: Mathematics 63 and Physics 41. Three class sessions and one two-hour computation. 4 s.h. (w) PALMER AND VAIL

EE 56. ELECTRIC NETWORKS II.—Network impedance and admittance functions; steady-state response to sinusoidal forcing; Fourier series analysis; pole-zero analysis of networks; matrices in network analysis; introduction to synthesis of reactance networks. Prerequisite: EE 55. Concurrent: Mathematics 64. Three class sessions and one two-hour computation. 4 s.h. (w) GEORGE AND PALMER

EE 109-110. ELECTROMAGNETIC SYSTEMS.—Mathematical and physical consideration of energy relations and forces associated with both discrete particles and materials in electromagnetic fields: vector notation; Maxwell's equations; static and quasi-static fields; energy, power flow, and impedance; particle ballistics; electron emission; control of conduction in vacuums, gases, liquids, and solids; resistance,

* Offered only upon sufficient demand; enrollment limited.

capacitance, and inductance of systems of conductors; forces between relatively moving bodies; dielectric and magnetic material. Prerequisite: EE 56. Concurrent: Mathematics 111. Three class sessions and one two-hour computation. 8 s.h. (w) ABSHER AND ARTLEY

EE 111-112. ELECTRICAL PRINCIPLES LABORATORY.—Instruction in electrical laboratory techniques; experimental study of basic principles of electromagnetics, electronics, and electric and magnetic circuits. Prerequisite: EE 56. Concurrent: EE 109-110. Two three-hour laboratory periods throughout first semester; one throughout second semester. 3 s.h. (w) ABSHER, FREKKO, AND PALMER

EE 123. FUNDAMENTALS OF ELECTRICAL ENGINEERING.—Introductory treatment of electrical engineering fundamentals for students majoring in other branches of engineering; principles of electric circuits, fields, and electronics. Prerequisites: Mathematics 63 and Physics 42. Concurrent: EE 125. Three class sessions. 3 s.h. (w) BARNES AND WORTMAN

EE 124. INDUSTRIAL ELECTRICAL ENGINEERING.—Introductory treatment of industrial applications of electrical engineering fundamentals for students majoring in other branches of engineering: alternating- and direct-current machinery; electronic and electromagnetic control systems; illumination principles. Prerequisite: EE 123. Concurrent: EE 126. Three class sessions. 3 s.h. (w) BARNES

EE 125. ELECTRICAL FUNDAMENTALS LABORATORY.—Laboratory course paralleling course EE 123, with which it should be taken concurrently. One three-hour laboratory. 1 s.h. (w) FENG AND OWSLEY

EE 126. INDUSTRIAL ELECTRICAL LABORATORY.—Laboratory course paralleling course EE 124, with which it should be taken concurrently. One three-hour laboratory. 1 s.h. (w) FENG, FREKKO, AND OWSLEY

EE 127. *ELECTRONICS FOR ENGINEERS.—Introductory treatment of principles and applications of engineering electronics for students majoring in other branches of engineering: amplifiers; feedback; basic communications and control circuits; electronic computers. Prerequisite: EE 123 and permission of instructor. Three class sessions. 3 s.h. (w) STAFF

EE 159. *TRANSMISSION.—Development of theory underlying transmission of electric energy over conductors at both power and communication frequencies. Two class sessions and one two-hour computation. Prerequisite: EE 110; Mathematics 111. Elective for electrical majors. 3 s.h. (w) STAFF

EE 165-166. ELECTRICAL ENGINEERING SEMINAR.—A course which provides an opportunity to consider matters related to the professional practice of electrical engineering; to relate the undergraduate program of studies to current practice; and to improve the ability to communicate more effectively, both in verbal and written form, particularly with regard to technical material. One class session. 2 s.h. (w) STAFF

EE 173-174. *PROJECTS IN ELECTRICAL ENGINEERING.—A course which may be undertaken only by seniors who show special aptitude, or who may have had previous experience directly related to the proposed project. The consent of the Chairman of the Department must be obtained before registering. Elective for electrical majors. 3-6 s.h. (w) STAFF

EE 177. *ENERGY TRANSMISSION AND RADIATION.—A more advanced treatment of electromagnetic theory than is afforded by EE 109-119, with particular application to wave guides and antennas. Prerequisite: EE 110 and permission of instructor. Three class sessions. 3 s.h. (w) ARTLEY

EE 179. *ADVANCED ELECTRICAL MEASUREMENTS.—Theory and practice of measurements of electrical quantities at extremes of voltage, current, power, and frequency. Two class sessions and one three-hour laboratory. Prerequisite: EE 110 and permission of instructor. 3 s.h. (w) OWEN

EE 181-182. ELECTRONIC NETWORKS.—Advanced topics in engineering electronics: piece-wise linear approximation for nonlinear operation and incremental models for linear operation of basic electronic circuits; narrow- and wide-band amplifiers; feedback amplifiers; oscillators; modulation and demodulation; micro-

wave devices; communication systems. Prerequisite: EE 110. Concurrent: EE 183-184. Three class sessions. 6 s.h. (w) GEORGE, KRAUSS, AND PILKINGTON

EE 183-184. ELECTRONICS LABORATORY.—Laboratory course paralleling and integrated with course EE 181-182, with which is should be taken concurrently. One three-hour laboratory. 2 s.h. (w) BARNES, FENG, GEORGE, AND ROE

EE 191-192. ELECTRIC MACHINERY.—Application of circuit and field principles to underlying theory of static and rotating electric machinery; mathematical techniques for analyzing transformers and electromechanical energy converters as individual devices and when interconnected into systems. Prerequisite: EE 110. Concurrent: EE 193-194. Three class sessions. 6 s.h. (w) JENKINS AND MEIER

EE 193-194. ENERGY CONVERSION LABORATORY.—Selected experiments in energy conversion combining the theory and practice of transformers, electromechanical devices including motors and generators, photovoltaic sources, thermoelectric generators, static d-c to a-c and d-c to d-c converters. Prerequisite: EE 112. Concurrent: EE 192-193. 2 s.h. (w) BUMGARDNER, MEIER, AND ROE

EE 199. *LINEAR FEEDBACK SYSTEMS.—Analysis and design of linear; continuous-data feedback control systems; stability tests; time and frequency domain methods; root locus method; performance specifications; study of electrical, mechanical, hydraulic, aerodynamic, pneumatic, and thermal systems. Two class sessions and one three-hour laboratory. Prerequisite: Permission of instructor. 3 s.h. (w) WELLS

EE 201. ENERGY SYSTEMS.—Application of general energy concepts to specific engineering devices and systems; use of mathematical models to describe concepts of energy storage, transfer, transformation, and control that are applicable to electromagnetic, mechanical, fluid, and thermal systems; the Lagrangian, Hamiltonian formulation, and tensors. Prerequisite: Permission of instructor. 3 units. (w) ARTLEY

EE 203, 204, INFORMATION SYSTEMS.—General concepts of information storage, transfer, and processing: information theory, coding, noise theory, and response of information-handling systems in the time and frequency domains. Applications of information concepts to specific engineering situations: modulation, sampling, optimum filtering, detection in presence of noise, and comparisons of various systems. Prerequisite: Permission of instructor. 6 units. (w) GEORGE AND OWEN

EE 207. *NETWORK SYNTHESIS.—Linear network theory, including a review of time and frequency domain analysis; network graphs; network functions and realizability conditions; driving point impedance synthesis of passive networks; driving point and transfer specifications; approximation methods. Prerequisite: Permission of instructor. 3 units. (w) KRAUSS, OWEN, AND VAIL

EE 211. SOLID-STATE THEORY.—The fundamental theory of wave motion in solids, including wave mechanics; variational method; perturbation theory; many-electron problems; one-electron approximation; free-electron approximation; electron spin; Brillouin zones; time-dependent Schrodinger's equation; and transition probabilities. Introduction to the thermodynamics of solids, including Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; ensembles; entropy; and free-energy functions. Prerequisite: Permission of instructor. 3 units. (w) ARTLEY, BURGER, PILKINGTON, AND VAIL

EE 212. SOLID-STATE MATERIALS.—Concepts of solid state physics as applied to engineering materials: electrical, magnetic, thermal, and mechanical properties of solids: dielectrics; ferroelectrics; semiconductors; magnetic materials; and superconductors. Prerequisite: EE 211. 3 units. (w) ARTLEY, BURGER, PILKINGTON, AND VAIL

EE 213. MAGNETICS.—A study of ferromagnetic and ferrimagnetic materials, including effects of thermal conditions and treatment, mechanical stress, magnetic field intensity, crystal structure and macroscopic geometry. Study emphasizes relationships of fundamental concepts of engineering interest. Prerequisite: EE 211 or equivalent. 3 units. (w) ARTLEY AND WILSON

* Offered only upon sufficient demand; enrollment limited.

EE 222. NONLINEAR ANALYSIS.—Introduction to methods of analyzing engineering systems described by nonlinear differential equations: analytic, numerical, graphical, and series approximation methods; analysis of singular points; stability of nonlinear systems. Application of various methods, such as the modified Euler, Runge-Kutta, isoclines, perturbation, reversion, variation of parameters, residuals, harmonic balance, Bendixon, and Liapounov to phenomena of nonlinear resonance, subharmonics, relaxation oscillations, and forced oscillating systems. Prerequisite: Permission of instructor. 3 units. (w) WILSON

EE 231. *NUCLEAR ENGINEERING.—Review of nuclear physics; fission and the chain reaction; nuclear reactor principles; materials, instrumentation, and control of nuclear reactors; selected applications and techniques of nuclear engineering. Prerequisite: Permission of instructor. 3 units. (w) MEIER

EE 241. *FEEDBACK CONTROL SYSTEMS.—Analysis and design of linear sampled-data systems; linear systems subjected to random inputs; analytical design using mean square error and integral square error criteria; nonstationary and nonlinear systems. Prerequisite: Permission of instructor. 3 units. WELLS AND WILSON

EE 259. *ADVANCED ELECTRIC ENERGY CONVERSION.—Equations of motion of electromechanical systems, fields and lumped parameters, state function concepts; mathematical techniques for analyzing electromechanical devices and systems; transducers; unified treatment employing matrix, tensor, and block-diagram concepts to obtain response under static and dynamic conditions; the generalized rotating machine. Prerequisite: Permission of instructor. 3 units (w) MEIER AND WILSON

The Department offers work leading to graduation with distinction. See the section on Honors.

ENGINEERING SUBJECTS COMMON TO ALL CURRICULA

ENGRG 1. ENGINEERING DESIGN I.—The study of elementary engineering graphics with emphasis on third angle projection, pictorial drawing, dimensioning, working drawings, pencil and ink techniques. 2 s.h. (w) HAINES, LEWIS, AND STAFF

ENGRG 2. ENGINEERING DESIGN II.—A study of drawing board geometry with emphasis on line and plane problems, developments, and intersections. Further emphasis on drawing techniques. Prerequisite: Engrg 1. 2 s.h. (w) HAINES, LEWIS, AND STAFF

ENGRG 57. STATICS.—A study of force systems equilibrium by algebraic and graphic methods, friction, centroids, moments of inertia. Prerequisite: Engrg 1; concurrent: Phys 41 and Math 63. 3 s.h. (w) ARGES

ENGRG 60. ENGINEERING MECHANICS.—A study of statics and dynamics, as applied to particles and rigid bodies. Fundamentals are developed using vector and scalar values. Concurrent: Phys. 41 and Math 63. 4 s.h. (w) ARGES, BARTON, AND WOOD

ENGRG 107. MECHANICS OF MATERIALS.—Stresses and strains in elastic bodies; shear and moment diagrams; stresses in beams; beam deflections by double integration and area—moments; statically indeterminate beams, torsion, principal stresses. Prerequisite: Engrg 57 or Engrg 60; concurrent: Math 64. 3 s.h. (w) ARGES AND PALMER

ENGRG 109. MECHANICS OF MATERIALS LABORATORY.—Study and use of testing machines and strain gages; tests to determine significant mechanical properties of common engineering materials; experimental verification of the elementary theory of structural members. Concurrent: Engrg 107. 1 s.h. (w) BARTON AND SHEPPARD

ENGRG 115. DYNAMICS.—General principles of dynamics as applied to particles and rigid bodies. Translation, rotation, general plane motion, work and energy, impulse and momentum, gyroscopic motion. Prerequisite: Engrg 57; concurrent: Math 64. 3 s.h. (w) WOOD

ENGRG 128. FLUID MECHANICS.—Physical properties of fluids, fluid statics, continuity and energy principles, pressure-momentum principle, elementary principles of turbines and pumps, flow of a real fluid, dimensional analysis and dynamic

similarity, fluid flow in closed conduits and in open channels; fluid measurements. Prerequisite: Engrg 60, or concurrent: Engrg 115; prerequisite: Math 64. 3 s.h. (w) HARRAWOOD AND KUMAR

ENGRG 153. *ARCHITECTURAL ENGINEERING.—The application of engineering principles to architecture; the influence of engineering function and trends on design; the interrelationship of engineering with architecture; the analysis of structural details and of processes of construction; field trips and inspection of construction projects. Prerequisite: Permission of instructor. 3 s.h. (w) HAINES

ENGRG 169. *LEGAL ASPECTS OF ENGINEERING.—A course designed to introduce engineering students to those aspects of the law encountered in the practice of engineering. Subjects included are: contracts and specifications, real and personal property, torts, insurance, agency, equity, evidence, labor management, sales, expert testimony, engineering registration and ethics. Open to seniors only. 3 s.h. (w) OLIVE

ENGRG 170. *PATENT LAW FOR ENGINEERS.—A course designed to familiarize engineering students with the legal principles and procedures for protecting patentable inventions, such as drafting and analysis of specifications and claims, study of infringements, assignments, licenses, and record documentation. Open to seniors only. 3 s.h. (w) OLIVE

MECHANICAL ENGINEERING

PROFESSOR KENYON, ACTING CHAIRMAN AND DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS MACDUFF AND MERIAM; ASSOCIATE PROFESSORS BOYLE, ELSEVIER, AND PEARSALL; ASSISTANT PROFESSORS BUZZARD, HARMAN, LEWIS, AND NASH; VISITING PROFESSOR DJORDJEVIC; VISITING LECTURER MIXON; MESSRS. BIGGERS, BREALEY, KIM, TITUS AND WYATT

ME 52. KINEMATICS, KINETICS.—Analytical and numerical studies of displacement, velocity, and acceleration in mechanical elements and systems. Synthesis and analysis of mechanisms for automatic machines, application of work, energy, impulse and momentum. Prerequisite: Engrg 2. Concurrent: Phys 41, Math 63. 3 s.h. (w) NASH

ME 59. MATERIALS AND PROCESSES.—Elementary metallurgy and introduction to modern theories of the solid state; selection and properties of engineering materials and effect of forming processes upon properties. Prerequisite: Senior standing. 3 s.h. (w) PEARSALL

ME 101-102. ENGINEERING THERMODYNAMICS.—A basic study of the laws of thermodynamics and their use in engineering analysis and design. Properties of pure substances; vapor cycles; fluid flow; thermodynamic machinery; introduction to combustion processes. Prerequisite: Chem 1, Phys 42. Concurrent: Math 64. 6 s.h. (w) HARMON, ELSEVIER AND KENYON

ME 103. THERMODYNAMICS.—A terminal course in thermodynamics and its engineering applications for civil and electrical engineering students. The basic laws of thermodynamics; gases; vapors; elements of combustion and heat transfer. Prerequisite: Chem 1, Phys 42. Concurrent: Math 64. 3 s.h. (w) ELSEVIER AND MIXON

ME 105. DYNAMICS OF FLUIDS.—A study of liquids at rest and in motion. Principles of laminar and turbulent flow through pipes, orifices, nozzles, and metering devices; impulse and momentum concepts; vortex action, pumps, turbines and fluid couplings; resistance of immersed and floating bodies. Prerequisite: Phys 41, Math 63. 3 s.h. (w) KENYON AND MACDUFF

ME 106. HEAT TRANSFER.—A basic course covering the elements of radiation, conduction, and convection. Methods of temperature measurement, steady and transient heat flow, analytical and numerical methods. Concurrent: ME 101, 105; Math 64. 3 s.h. (w) KENYON AND MIXON

ME 114. JUNIOR MECHANICAL ENGINEERING LABORATORY.—Measure-

* Offered only upon sufficient demand; enrollment limited.

ment of mechanical and thermodynamic properties of systems. Student planning and reporting of laboratory experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Prerequisite: ME 101. 105. 2 s.h. (w) STAFF

ME 116. MECHANICAL ENGINEERING LABORATORY.—Primarily for civil and electrical engineering students. Selected laboratory experiments in measuring mechanical and thermodynamics properties of systems. Student planning of experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Concurrent: ME 103. 1 s.h. (w) STAFF

ME 128. *DYNAMICS OF GASES.—The flow of compressible fluids at high velocities. One-dimensional compressible flow; area change; normal shock; friction and heat transfer; Mach number. Prerequisite: ME 102. Concurrent: ME 106. 3 s.h. (w) STAFF

ME 141. MACHINE DESIGN.—Elements of mechanism with special attention to the role of invention in mechanical design. Velocity and acceleration in mechanisms from both scalar and vector viewpoints. Prerequisite: Math 63. Concurrent: ME 52, E 57 or 60. 3 s.h. (w) NASH

ME 142. MACHINE DESIGN.—Continuation of ME 141. Static and dynamic forces in machinery. The instant center; theory of gear tooth profiles. Design of machine elements, such as gears, springs, and bearings; complex parts. Prerequisite: ME 141. Concurrent E 107. 3 s.h. (w) NASH

ME 153. *HEATING, AIR CONDITIONING, AND REFRIGERATION.—Principles of thermodynamics, heat transfer, and fluid flow applied to comfort and industrial air conditioning. Cycles and equipment for heating, cooling, and humidity control. Air transmission and distribution. Modern vapor compression, absorption and low temperature refrigeration cycles and systems. Prerequisite: ME 102 and 106. 3 s.h. (w) ELSEVIER

ME 156. COMBUSTION ENGINES.—A study of cycles, fuels, and fuel mixtures in piston, ram jet, and rocket engines. Comparison of real and theoretical cycles; carburetion and fuel injection systems; modern developments. Prerequisite: ME 102. 3 s.h. (w) ELSEVIER

ME 157. *PUMPS, COMPRESSORS AND TURBINES.—An introduction to the theory and design of centrifugal pumps and compressors, axial-flow compressors, impulse and reaction turbines, and gas turbine plants, combustion systems and regenerators. Concurrent: ME 102 and 106. 3 s.h. (w) BOYLE

ME 159-160. SENIOR MECHANICAL ENGINEERING LABORATORY.—Laboratory determination of heat flow and operating characteristics of engines, fans, pumps, and other power and refrigeration plant components; vibrational systems, control systems, analog methods. Student planning and reporting of original experiments. 2 s.h. (w) STAFF

ME 162. POWER PLANTS.—Basic concepts of thermodynamics, heat transfer and fluid flow are combined with industrial data for the consideration of real power plant problems. Selection of steam generators, prime movers, fans, pumps, heaters, and piping systems with regard to engineering and economic points of view. Prerequisite: ME 102. 3 s.h. (w) HARMAN

ME 163. *VIBRATION CONTROL.—An introduction to the dynamics of mechanical systems; equilibrium, stability lumped and distributed systems, cradle and field balancing. System analysis by classical differential equations, mechanical impedance, operational calculus and analog stimulation. Prerequisite: Math 64. ME 141. 3 s.h. (w) BUZZARD

ME 164. *ENGINEERING ANALYSIS.—A study of a series of engineering problems with particular reference to mathematical and graphical methods of solution and engineering interpretation of results. Concurrent: Math 64. 3 s.h. (w) BOYLE

ME 166. *AIR CONDITIONING DESIGN.—Typical air conditioning systems considered in relation to specific problems. Equipment analysis and performance, economic considerations, system control and response, noise generation and attenuation. Prerequisite: ME 153. 3 s.h. (w) ELSEVIER

ME 167. INDUSTRIAL ENGINEERING.—A study of the organization and functioning of industries; function of engineering in industry; job analysis and self evaluation; professional and executive responsibility of the mechanical engineer. Prerequisite: Senior standing. 3 s.h. (w) LEWIS

ME 168. *INDUSTRIAL ENGINEERING PRODUCTION METHODS.—Study of engineering theory, methods and controls in production. Methods, motion and time study, plant lay-out, production and quality control, industrial safety, operations research. Prerequisite: Senior standing, ME 167 or equivalent. 3 s.h. (w) LEWIS

ME 171. RESPONSE OF PHYSICAL SYSTEMS.—An introduction to the basic fundamentals of instrumentation and of the control of processes and systems with emphasis on correlation of analysis and experimental results. Prerequisite: Math 111. 3 s.h. (w) BUZZARD AND MACDUFF

ME 173-174. MECHANICAL ENGINEERING SEMINAR.—A course designed to keep the students abreast of progress in the engineering field and to develop their ability to express ideas effectively in speech and writing. Open to seniors only. 2 s.h. (w) STAFF

ME 182. *FUNDAMENTALS OF NUCLEAR ENGINEERING.—Review of nuclear physics, nuclear interactions and cross sections, neutron induced chain reactions, shielding, hazards, isotope utilizations, reactor systems and power reactors. Prerequisite: Permission of instructor. 3 s.h. (w) KENYON

ME 197-198. PROJECTS IN MECHANICAL ENGINEERING.—This course may be assigned by the Chairman of the Department to outstanding seniors who express a desire for such work and who have shown aptitude for research in one distinct field of mechanical engineering. Prerequisite: 3.0 average and senior standing. 1-6 s.h. (w) STAFF

ME 201. *THEORETICAL AND APPLIED MECHANICS.—Introduction to the theory of elasticity and vibration analysis. 3 units. (w) MERIAM

ME 202. *THEORETICAL THERMODYNAMICS.—Classical thermodynamics based on the First, Second, and Third Laws of Thermodynamics. Classical and statistical thermodynamics of ideal gases. Properties of real gases, equilibrium, combustion, and irreversible processes. 3 units. (w) HARMAN

ME 221. *ANALYSIS OF INCOMPRESSIBLE AND COMPRESSIBLE FLUID FLOW.—Flow of incompressible and compressible fluids; concepts of subsonic, sonic and supersonic flow; experimental methods. 3 units. (w) HARMAN

ME 222. *ANALYSIS OF HEAT TRANSFER.—Heat transfer by conduction, convection, and radiation; lumped and distributed heat capacity, resistance, losses; steady and transient flow. 3 units. (w) KENYON

ME 231-232. *SYSTEMS ENGINEERING.—Methods of obtaining parameters for strength, response, and stability studies of mechanical systems. Impedance and operational means of analysis; mechanical and electronic analogs; nonlinear theories. 6 units. (w) MACDUFF

ME 265. *ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 units. (w) MEMBERS OF THE GRADUATE STAFF

ME 280. *NUCLEAR REACTOR POWER CYCLES.—Introduction to basic reactor principles and reactor types. Consideration of thermodynamic cycles for nuclear reactors for stationary and mobile plants. Analysis of fluid flow and heat transfer problems unique to reactors with development of methods of reactor safety techniques. Metallurgical problems peculiar to reactor design. 3 units. (w) KENYON

The Department offers work leading to graduation with distinction. See the section on Honors.

* Offered only upon sufficient demand; enrollment limited.

Index

Academic-Professional Combinations, 53-55
Academic Regulations, 31-39
Accounting Courses, 71-72
Accounting, Specialized Program, 44
Administration Officers, 2
Admission, 6
Advanced Placement, 37
Advanced Standing, 7
Aesthetics Courses, 56
Air Force Reserve Corps, 16-17
Air Science Courses, 56-57
Anatomy Course, 101
Anthropology Courses, 131
Appointments Office, 9
Art Courses, 56
Athletics, 9-12
Attendance, 35
Audit, 31
Automobile Regulations, 40

Bachelor of Arts, 42
Bachelor of Science, 48
Bachelor of Science in Engineering, 49
Botany Courses, 60
Business Administration Courses, 68
Business, Specialized Program in, 44

Calendar of the Colleges, 5
Chemistry Courses, 63
Chinese, 65
Civil Engineering Courses, 138
Class Honors, 36
Class Standing, 32
Classical Studies, 65
College of Engineering, 138
Colloquium, 67
Common Engineering Courses, 143
Comparative Literature, 67
Conduct, 40
Continuation in College, Requirements for, 31
Course Load, 31
Courses of Instruction, 56

Degrees, Requirements for, 42
Dining Halls, 21, 22
Discipline, 40
Dismissal, 34
Distinguished Professor Seminars, 38
Drama Courses, 78

Early Decision Plan, 6
Economics Courses, 68
Education Courses, 74
Electrical Engineering Courses, 140
Elementary School Teaching, 45
Employment, Student, 19
English Courses, 78
Examinations, 35

Financial Information, 19
Forestry Combination Course, 53
Forestry Courses, 84
Fraternities, 13
French Courses, 125

Geology Courses, 84
Germanic Languages and Literature, 85
Grades, 34
Grade Reports, 35
Graduate School, Preparation for, 46
Graduation Requirements, 31, 33
Graduation Honors, 36
Graduation with Distinction, 37
Greek Courses, 65

Health Education Courses, 87, 89
Hindi-Urdu, 90
History Courses, 91

Honors, 36
Honors-Masters Program, 97

Independent Study, 38
Indic Languages, (See Hindi-Urdu)
Intercollegiate Program, 11
Italian, 127

Latin Courses, 66
Law Combination Courses, 54
Law School, Preparation for, 47
Linguistics, 97
Library, 8
Living Accommodations, 20, 21
Loans, 25

Mathematics Courses, 98
Mechanical Engineering Courses, 144
Medals, 27
Medical Care, 8
Medical School, Preparation for, 47
Medical Science Course, 101
Music Courses, 101
Music Education, 45, 103

Naval Reserve Corps, 14
Naval Science Courses, 106

Organizations, 12

Participation in Activities, 41
Philosophy Courses, 108
Physical Education Courses, 87
Physical Education Requirements, 9
Physics Courses, 110
Political Science Courses, 112
Portuguese, 127
Prizes, 27
Psychology Courses, 117

Quality Credit, 31, 32
Quantity Credit, 31, 32

Reading-Out of Courses, 38
Readmission of Former Students, 41
Registration, 33, 41
Religious Courses, 121
Religious Life, 13
Religious Work, Specialized Program in, 47
Reserve Officers Training Corps, 14
Residence Requirements, 33
Romance Languages, 125
Russian Courses, 130

Scholarships, 23
Science Education Major, 46
Secondary School Teaching, 46
Sociology Courses, 131
Sororities, 13
Spanish Courses, 128
Special Students, 7, 22
Speech Courses, 78
Student Aid, 23
Student Publications, 12
Student Union, 12
Study Abroad, 39
Summer Session, 18
Summer Study Abroad, 39

Teaching Requirements, 45
Transcript Requests, 22, 41
Transfer Credit, 35
Tuition and Fees, 20

Uniform Course Requirements, 42, 48
University Counseling Service, 9
University Courses, 134

Zoology Courses, 134

BULLETIN
OF
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The School of Nursing

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For Bulletin of Information for Prospective Students, apply to *The Registrar*, Duke University, Durham, N. C. 27706

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OF

DUKE UNIVERSITY

THE SCHOOL OF NURSING

1965-66

DURHAM, NORTH CAROLINA

1965

Contents

PAGE

Calendar of the School of Nursing and the Colleges 3

Officers of the School 5

Instructional Staff 7

General Information 10

Admission 21

Financial Information and Living Accommodations 25

General Regulations 32

Requirements of Programs in Nursing 40

General Regulations Governing Graduate Study 49

Master of Science in Nursing 55

Calendar of the School of Nursing

1965

THE SUMMER SESSION

June	7	Monday, Clinical courses for Summer term begin for pre-registered Junior and Special Students in School of Nursing.
June	12	Saturday. Registration for Summer Session courses.
June	14	Monday. Instruction begins in all courses scheduled for first term of Summer Session.
July	3	Saturday. No Summer Session classes meet.
July	16, 17	Friday, Saturday. Examinations.
July	19	Monday. Registration for new students, second term of Summer Session courses.
July	20	Tuesday. Instruction begins in all second term Summer Session courses.
July 31, August	14	Saturdays. No Summer Session classes meet.
August	6	Friday. Clinical courses end.
August	23, 24	Monday, Tuesday. Final examinations.

1965-1966

FALL SEMESTER

September	8	Wednesday. Clinical courses as scheduled.
September	17	Friday, 7:30 p.m. Orientation begins for all entering Freshmen and new students with advanced standing.
September	20	Monday. Registration and matriculation of students who have not pre-registered.
September	23	Thursday. Fall semester classes begin.
November	6	Saturday. Last day for reporting six-weeks grades.
November	15-18	Pre-registration for Spring semester 1966.
November	24	Wednesday, 12:30 p.m. Thanksgiving recess begins.
November	29	Monday, 8:00 a.m. Classes are resumed.*
December	11	Saturday. Founder's Day.
December	18	Saturday, 12:30 p.m. Christmas recess begins.

1966

January	3	Monday, 8:00 a.m. Classes are resumed.*
January	15	Saturday, 12:30 p.m. Fall semester classes end.
January	18	Tuesday. Final examinations begin.
January	28	Friday. Final examinations end.

SPRING SEMESTER

February	1	Tuesday. Registration and matriculation of new students.
February	3	Thursday. Spring semester classes begin.
March	16	Wednesday. Last day for reporting six-weeks grades.
March	21-24	Pre-registration for Summer Session.

March	26	Saturday, 12:30 p.m. Spring recess begins.
April	4	Monday, 8:00 a.m. Classes are resumed.*
May	19	Thursday, 5:00 p.m. Spring semester classes end.
May	21	Saturday. Final examinations begin.
June	1	Wednesday. Final examinations end.
June	4	Saturday. Commencement begins.
June	5	Sunday. Commencement Sermon.
June	6	Monday. Graduation Exercises.

* Nursing Laboratory sessions in Clinical Nursing courses are resumed according to the normal schedule.

Officers of the School for the Year 1965-66

General Administration

Douglas Maitland Knight, Ph.D., Litt.D., LL.D.
President of the University

Robert Taylor Cole, Ph.D.
Provost

Gerhard Chester Henricksen, M.A., C.P.A.
Vice President for Business and Finance
Treasurer

Everett Harold Hopkins, M.A., LL.D.
Vice President for Planning and
Institutional Studies and Assistant Provost

Frank Leon Ashmore, A.B.
Vice President for Institutional Advancement

Charles Edward Jordan, A.B., LL.D.
Vice President for University Relations

Frank Traver de Vyver, Ph.D.
Vice Provost

Harold Walter Lewis, Ph.D.
Dean of Arts and Sciences and Vice Provost

Barnes Woodhall, M.D.
Vice Provost

Benjamin Edward Powell, Ph.D.
Librarian

Richard Lovejoy Tuthill, Ed.D.
University Registrar

Craufurd David Goodwin, Ph.D.
Secretary and Assistant Provost

Edwin Constant Bryson, LL.B.
University Counsel

School of Nursing Administration

March, 1965

Ann Madeline Jacobansky, R.N., M.Ed. *Dean, School of Nursing*	1200 Leon St.
(Mrs.) Edith Brocker, R.N., M.A. *Assistant Dean of the School of Nursing* *Director, Undergraduate Studies*	1326 Welcome Circle
Capitola B. Mattingly, R.N., M.A., M.S.N. *Director of Graduate Studies* *Director, Graduate Medical and Surgical Nursing Program*	904 Demerius Street
Virginia Gover, R.N., M.S. *Director, Division of Fundamentals of Nursing*	2722 Brown Avenue
Theresa Horton, R.N., M.N.Ed. *Director, Division of Maternal and Child Health Nursing*	810/3 Clarendon
(Mrs.) Ruth Harris, R.N., M.S. *Director, Division of Medical-Surgical Nursing*	2121 Ruffin Street
Mary Jane Mordan, R.N., M.Ed., M.S.N. *Assistant Director of Undergraduate Studies*	2220 Elba Street
(Mrs.) Suzanne Parks, R.N., M.S.N. *Acting Director, Division of Psychiatric Nursing*	Route 2, Box 384-A

Faculty

March, 1965

Julia Jane Agner, R.N., M.S. *Instructor in Nursing*	1806 Northgate Street
Phoebe J. Ahlgren, R.N., M.S. *Assistant Professor of Nursing*	101 Newell Street
Edith Perryman Brocker, R.N., M.A. *Associate Professor of Nursing*	1326 Welcome Circle
Elinor Caddell, R.N., M.S.N. *Assistant Professor of Nursing*	707 Louise Circle
Janet Campbell, R.N., M.A. *Assistant Professor of Nursing*	East Lake Anne Drive, Route 8, Raleigh
Lynn Collins, R.N., M.S.N. *Instructor in Nursing*	1309-C Leon Street
Joyce Crane, R.N., M.S.N. *Assistant Professor of Nursing*	2717 August Drive
Charles Culver, Ph.D. *Assistant Professor of Psychology*	2920 Guess Road
Ollie Davenport, R.N., M.S.N. *Assistant Professor of Nursing*	905 W. Knox Street
E. Gwendolyn Fortune, R.N., M.S.N. *Associate Professor of Nursing*	212 E. Markham Street
Margaret A. Gaddy, R.N., M.P.H. *Instructor in Nursing*	Rte 4, Box 152-C Siler City, N. C.
Virginia F. Gover, R.N., M.S. *Assistant Professor of Nursing*	2722 Brown Avenue
Ruth J. Harris, R.N., M.S. *Assistant Professor of Nursing*	2121 Ruffin Street
Carol Hogue, R.N., M.S.N. *Assistant Professor of Nursing*	2913 Welcome Drive
Theresa Horton, R.N., M.N.Ed *Assistant Professor of Nursing*	810/3 Clarendon Street
Ann M. Jacobansky, R.N., M.Ed. *Professor of Nursing*	Apt. H-8, 1200 Leon Street
Agnes J. Janoscrat, R.N., M.S.N. *Instructor in Nursing*	108½ Buchanan Blvd.
Patricia Lawrence, R.N., M.A. *Instructor in Nursing*	2318 Broad Street
Rosemary Lemmond, R.N., M.S.N. *Instructor in Nursing*	1605 Sedgefield
Margaret I. Lesko, R.N., M.S.N. *Instructor in Nursing*	2303 Lednum Street
Capitola B. Mattingly, R.N., M.S.N. *Associate Professor of Nursing*	904 Demerius Street
Wilma A. Minniear, R.N., M.S.N. *Associate Professor of Nursing*	212 E. Markham Street

Mary Jane Mordan, R.N., M.S.N., M.Ed. *Assistant Professor of Nursing*	2220 Elba Street
Nancy Nolan, R.N., M.S.N. *Instructor in Nursing*	705 Louise Circle
Suzanne Parks, R.N., M.S.N. *Assistant Professor of Nursing*	Route 2, Box 384-A
Roberta J. Phillips, R.N., M.S.N. *Instructor in Nursing*	20 South Circle Drive Chapel Hill, N. C.
Edythe Persing, R.N., M.S.N. *Assistant Professor of Nursing*	Rte 2, Chapel Hill, N. C.
Ruth R. Proctor, R.N., M.S.N. *Instructor in Nursing*	2417 Dellwood
Mary S. Steele, R.N., M.S.N. *Assistant Professor of Nursing*	1829 Forest Road
Ruby L. Wilson, R.N., M.S.N. *Assistant Professor of Nursing*	3006 University Drive
*Helen R. Young, R.N., M.S. *Assistant Professor of Nursing*	A3A University Apts.

* Leave of Absence Spring Semester 1965.

INSTRUCTIONAL ASSISTANTS

Beverly Bowser, R.N., B.S.N.
Grace Bullock, R.N., B.S.N.
Brenda Reed, R.N., B.S.N.

PART TIME INSTRUCTIONAL STAFF

Lelia Clark, R.N., M.A.
Director of Nursing Service
Professor of Nursing Service

Katherine Couch, R.N., B.S.N.
Instructional Assistant

Frances Dunham, Ph.D.
Assistant Professor of Psychology

Helen McLachlan, M.A.
Associate Professor of Dietetics

Margaret Mitchell, R.N., M.Ed.
Assistant Director of Nursing Service

Patricia Paulson, R.N., B.S.N.
Instructional Assistant

ADMINISTRATIVE STAFF

(Mrs.) Ruth E. Galanti, *Secretary to the Dean*
Dorothy Wilkinson, R.N., *House Counselor*
Raymond Ingraham, *Administrative Assistant*
Sandra Scott, M.A., *House Counselor*
Georgia Tweedy, M.A., *House Counselor*
(Mrs.) Bobbie Redding, M.L.S., *Librarian*
(Mrs.) Esther Weller, *Records Clerk*
(Mrs.) Ruth Pratt, R.N., *Health Office Nurse*
(Dr.) Cynia Shimm, M.D., *Student Health Physician*

School of Nursing Committees

EXECUTIVE COMMITTEE OF SCHOOL OF NURSING

Chairman: Dean Ann M. Jacobansky
Director, Graduate Studies: Capitola Mattingly
Director, Undergraduate Studies: Mrs. Edith Brocker
Faculty: Miss Ruby Wilson, Mrs. Ruth Harris

DEPARTMENT OF UNDERGRADUATE STUDIES

Admissions Committee: M. J. Mordan, *Chairman;* P. Ahlgren, L. Collins, O. Davenport, R. Lemmond, E. Persing, E. Weller, *Secretary,* Miss Wilkinson

Curriculum Committee: E. Brocker, *Chairman;* J. Campbell, V. Gover, T. Horton, S. Parks, C. Mattingly, R. Harris

DEPARTMENT OF GRADUATE STUDIES

Curriculum Committee: C. Mattingly, *Chairman;* E. Brocker, J. Crane, G. Fortune, R. Harris, W. Minniear.

DUKE MEDICAL CENTER NURSING SERVICE ADMINISTRATION

Jane Bailey, R.N., M.S.N.
Director, Inservice Education

Geraldine Bodie, R.N., M.S.N.
Supervisor, Medical Nursing Service

Lelia R. Clark, R.N., M.A.
Director of Nursing Service
Professor of Nursing Service

Gertrude Elliot, R.N.
Supervisor, Obstetric-Gynecology Nursing Service

Bonnie Hensley, R.N., B.S.N.
Supervisor, Pediatric Nursing Service

Sara Jeffreys, R.N.
Supervisor, Surgical Nursing Service

Margaret E. Mitchell, R.N., M.S.
Assistant Director, Nursing Service
Instructor in Nursing

Elinor Osborn, R.N., B.S.
Supervisor, Out Patient Clinic

Helen Tilley, R.N., B.S.N.
Supervisor, Psychiatric Nursing Service

Margaret Watson, R.N.
Supervisor, Operating Room

DURHAM COUNTY HEALTH DEPARTMENT ADMINISTRATION

O. L. Ader, M.D., M.P.H., *Director*

Shirley E. Callahan, R.N., M.P.H.
Director of Nursing

NORTH CAROLINA CEREBRAL PALSY HOSPITAL ADMINISTRATION

Miss Christine Vick, *Administrator*

Ava Taylor Albritton, R.N., *Director, Nursing Service*

General Information

The School of Nursing functions within the philosophy of Duke University. This philosophy is epitomized by its motto, *Eruditio et Religio,* which "reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation and the church. Through changing generations of students, the objective has been to encourage each individual to achieve to the extent of his capacities an understanding and appreciation of the world in which he lives, his relationship to it, his opportunities, and his responsibilities."

The faculty of the School of Nursing ascribes to the concept that a professional nurse is a person who has acquired the specialized knowledge of Nursing, who has attained abilities useful in practice of Nursing, and who has developed attitudes appropriate to the profession of Nursing.

The faculty of the School of Nursing endeavors to promote a continuous change in the behavior of the students through experiences planned for the acquisition of specific knowledges which include: knowledge of scientific principles basic to Nursing, and knowledge of the tools, techniques, and resources useful in the practice of Nursing, and knowledge of characteristics of the Health and Welfare Institutions.

The faculty of the School of Nursing endeavors to promote a continuous change in the behavior of the students through experiences planned for the attainment of skills which include: the ability to make decisions independently or as group participants, the ability to relate separate phases of patient care to a total plan of patient care, the ability to observe specifics, and to interpret observations for self and others; the ability to work harmoniously and positively with people in ramified and complex situations and organizations.

The faculty of the School of Nursing endeavors to promote a continuous change in the behavior of students through experiences planned for the development of desirable attitudes which include: a concern for personal enrichment, an appreciation of and respect for individuality, an awareness of their role as citizens, for contributing to their own development and to that of their community and profession.

History

The School of Nursing of Duke University was established in association with the School of Medicine and Duke Hospital. The first class of students was admitted in January 1931. In 1953, the School of Nursing was incorporated into the Division of Health Affairs in the University structure. When established, the three year curriculum leading to the Diploma in Nursing was planned to prepare young women to meet community nursing needs; students who completed two years of acceptable college work were awarded a Bachelor of Science degree in Nursing in addition to the Diploma in Nursing. Trends in nursing created a demand for a four year program leading to the degree of Bachelor of Science in Nursing, and in 1953, the University Board of Trustees approved such a program. The Master of Science in Nursing degree was authorized in 1956.

Graduates of Duke University School of Nursing have served their communities in North Carolina and in other states; they have participated in their professional organizations on a national, state and local level. During World War II graduates of this school staffed the 65th General Hospital, the Duke University Medical Unit.

Relationship to the University

As a part of the University community, the School of Nursing serves its students as the focus of a total educational experience that only a major university can provide. It shares the same campus with Trinity College, College of Engineering, the Graduate School of Arts and Sciences, the Divinity School and the Schools of Law, Medicine and Forestry, and Duke Medical Center. The facilities for library, laboratory and field work and the many activities—religious, intellectual, cultural and athletic—form part of the environment which contributes to the development of students in nursing. Thus, the student in nursing may enjoy simultaneously the broad facilities and challenges of a University and the life and atmosphere of a professional school.

Membership and Accreditation

Duke University, which incorporates the School of Nursing with all of the other schools of the University, is a member of the Association of American Colleges and is accredited by the Southern Association of Colleges and Secondary Schools.

The generic program leading to the degree Bachelor of Science

in Nursing is accredited by the National League for Nursing and the North Carolina Board of Nurse Registration and Nursing Education.

The School is a member of the Department of Baccalaureate and Higher Degree Programs of the National League for Nursing.

Facilities

The facilities for instruction include the facilities available in the undergraduate, professional, and graduate schools and colleges of Duke University and the clinical facilities of Duke Hospital, the North Carolina Cerebral Palsy Hospital and the Durham Health Department.

In a wing of Hanes House are located the administrative offices of the School of Nursing, a large classroom seating 100 persons and equipped with audio-visual aids; a small classroom seating 50 persons and equipped with a screen and movie projector, a nursing arts laboratory with equipment for nursing practice for sixteen students, and conference room.

A reference library of 6,000 books and periodicals of special interest to students majoring in nursing is located in Hanes House. Students use the general and professional libraries of the University.

Duke Hospital, an integral part of the Medical Center, is a 627-bed, 30 bassinet general hospital which performs the concurrent functions of patient care and professional education. It admits over 20,000 patients a year, and maintains comprehensive diagnostic and treatment facilities for their care.

Different levels of patient care are provided by a minimal care unit and intensive care facilities in addition to conventional nursing units. Private, semi-private, and ward accommodations are available. Approximate daily patient census by service is as follows: Surgery (including Urology, Otolaryngology, Ophthalmology, and Orthopaedics), 230; Medicine (including Dermatology and Neurology), 150; Pediatrics, 55; Psychiatry, 45; and Obstetrics-Gynecology, 45. Surgical facilities include 18 operating rooms and a recovery room; over 15,000 surgical procedures are performed annually. Two obstetrical delivery rooms are maintained.

Outpatient services include a public clinic which totals some 121,000 visits a year, a private diagnostic clinic of comparable size and an active emergency service. All of the hospital components are located within a single building. Close working relationships between Duke Hospital and outside health agencies contribute to continued care.

Duke Hospital is approved for internship and residency training by the Council on Medical Education and Hospitals of the American Medical Association, and conducts an active educational program

involving some 280 house staff members. The hospital is fully accredited by the Joint Commission on Accreditation of Hospitals.

The Summer Session

The programs in the School of Nursing include courses in the Summer Session each year. Students in the School of Nursing have their courses approved in the School of Nursing and pre-register with the Summer Session office. Students from other colleges and universities who are admitted to the School of Nursing with advanced standing may be required to enroll in the Summer Session to make up deficiencies. Arrangements for registration are made through the office of the Dean of the School of Nursing.

The Summer Session of 1965 will include two terms: Term I, June 12 to July 17; Term II, July 19 to August 24. By attending both terms it is possible for a student to earn as many as twelve semester hours of credit.

While the basic purpose of the Summer Session is to serve the academic and the professional requirements of those who are interested in their own educational advancement, the University recognizes the need of, and provides for, a varied recreation program both athletic and social.

University fees for Summer Session 1965 will be charged at the rate of $35.00 per semester hour for those admitted with advanced standing. Board for resident students is charged at the rate of $75.00 for each term of Summer Session, room is $46.50 per person for a term of Summer Session. The cost of laundry is approximately $.50 per week. A bill is sent to all pre-registered students to permit payment in advance.

Medical Care

Students enrolled in a regular program of studies are eligible for the services offered under the health program of the school.

Complete medical facilities are available to students at the Duke Medical Center under the health program. With the necessary exceptions noted below, this type of care is furnished at a minimum expense to regularly enrolled students. The cost is included in the general fee paid each semester.

1. Physical Examination: Upon admission each student receives a complete physical examination including a chest x-ray. Thereafter, the physical examination is repeated annually; the chest x-ray semiannually.

2. Health Office: The health office in Hanes House, under the di-

rection of a physician is maintained for the students in the school. Advice, treatment and examination are available to students during regular hours. Consultation with Duke Medical Center staff specialists are arranged through the health office if necessary; drugs, dressings, laboratory tests and x-rays are arranged for as needed.

3. Hospitalization: A student requiring hospitalization is admitted to Duke Hospital. Admission is arranged through the health office. Medical and surgical care is under the supervision of a senior physician or surgeon. Hospital care includes staff nursing, drugs, dressings, laboratory tests and x-rays as needed. Hospital care is limited to thirty days.

If the student is covered by an insurance plan which provides for hospitalization, medical or surgical benefits, the coverage shall be applied to the cost of her care.

4. Exceptions: The health program does not cover private duty nursing, refraction of eyes, treatment of teeth, all chronic or pre-existing conditions such as diseased tonsils, hernias, pilonidal cysts, chronic skin conditions, endocrine disturbances; elective surgery, braces or any orthopaedic appliances; accidents or illness occurring during vacations or while off the campus. Blood used for transfusions must be paid for or replaced.

5. Psychiatric Consultation: Advisory consultation with a psychiatrist can be arranged through the Dean of the School of Nursing at no expense to the student. Further psychotherapeutic interviews are not included in the program.

6. Student Health Insurance: This may be secured through the University at a minimal rate. The insurance excludes any coverage for accident or illness cared for under the health program; insurance protection is furnished for off the campus and during vacations.

Professional, Social and Cultural Organizations

The scope of student organized activities fall into many broad interest areas, such as student government, service, professional, and honorary, publications and radio, music, drama and social.

Three magazines and a comprehensive year book are published by students. Student publications are under the control of the Publications Board, composed of members from the University staff appointed by the President; men from the Junior and Senior classes, elected by the students in Trinity College and the College of Engineering; women from the Junior and Senior classes, elected by the students in the Woman's College; and women elected from the Junior and Senior classes, elected by the students in the School of Nursing; and editors and managers of student publications, *ex officio* members with-

out voting power. No student publication can be established at the University without the approval of the Board.

The musical groups include the Chapel Choir, Symphony Orchestra, Concert Band, Glee Clubs, and several smaller groups. The Duke Players present a number of plays and readings each season. The Hoof 'n' Horn Club annually produces a musical comedy which is usually written, cast, directed, and acted by students from the three colleges.

Other campus groups, social in nature, sponsor dances, chaperoned cabin parties, concerts, and informal discussion groups. Social functions are frequent enough to afford the relaxation needed from work required in class room and laboratory.

The Union Building, located on the West Campus, is the student center for coeducational activities. It houses, among other groups, the Student Union organization. This body is unique in its coeducational aspects, bringing the men and women together in the carrying out of its stated purpose, "to stimulate, promote, and develop the social, recreational, cultural, educational, and spiritual activities of the students of Duke University." This purpose is carried out through a broad program including lectures, concerts, recreational activities, dances, exhibits, etc., adapted to the leisure time interests and needs of all students, who as undergraduate students are members of the Union.

Religious Life

"Eruditio et Religio," the motto emblazoned on the seal of the University, proclaims belief in the essential union of knowledge and religion in the educational process. The Gothic Chapel stands at the center of the campus, an inspiring symbol of the place of religion in the well-balanced life. The Chapel program encourages the cultivation of the moral and spiritual life of students.

Opportunities are provided through the Chapel and its related activities to translate worship into effective Christian living. Denominational, interdenominational, and interfaith loyalties are emphasized. Protestant, Roman Catholic, and Jewish students are organized in their respective groups, each having a denominational chaplain or adviser.

The University Religious Council, composed of students and faculty, promotes the interdenominational religious life in its many facets. The work of the Council and of the denominational program is under the supervision of the Chaplain to the University, who is also Director of Religious Life. He, with two Associate Directors of Religious Life and five denominational chaplains, coordinates the

religious program of the campus. They also offer personal guidance and spiritual counsel to all students in matters related to their faith.

The Dean of the Chapel is a key figure in student religious life. A regular preacher to the University, he preaches in the Chapel each month. He serves as an officiating minister and participates in the planning of the University's religious program.

Additional opportunities for the enrichment of the student's religious life are offered in organ and carillon recitals, choral concerts, other special services held from time to time, and in the sermons of distinguished guest preachers from many lands who are heard in the Duke Chapel. Some students, at their own discretion, participate actively in the programs of the downtown churches of their choice.

Student Government Association

The purpose of this organization is to regulate all matters pertaining to the life of the undergraduate women of Duke University School of Nursing not under the jurisdiction of the faculty; to increase a sense of individual responsibility; and to cooperate with the faculty in creating and maintaining high ideals for the Duke University School of Nursing. Each student is a member of this Association from the time of her entrance into the School of Nursing until her graduation. An Executive Council, consisting of fifteen elected members, coordinates the affairs of this Association, and with the student body is responsible for legislative action.

THE HONOR SYSTEM: The purpose of the Honor System is to secure the cooperation of the undergraduate student body in maintaining honorable conduct in all relations of student, professional and social life. It applies to every undergraduate student in the School of Nursing. The Honor System is a vital directive force in all phases of each student's life and is a major working part of the Student Government Association.

Santa Filomena

SANTA FILOMENA is a senior honorary society founded at Duke University School of Nursing. Its purpose is to recognize achievement and promote leadership. New members are publicly tapped at the May meeting of Student Government Association. They are selected from the rising Senior class and must fulfill the following three requirements:

1. Maintain a superior average throughout their first two years.
2. Demonstrate superior nursing ability.

3. Make some contribution to the betterment of the School of Nursing.

Santa Filomena strives to serve the nursing profession. Because all proceedings and ceremonies except tapping are secret, this honorary society can perform many varied service activities.

Santa Filomena's color is white; its flower, a white carnation; its pin, a small gold Florence Nightingale lamp.

The North Carolina State Student Nurses Association

As members of the Duke University School of Nursing, students are members of the North Carolina State Student Nurses' Association and the National Student Nurses' Association, such membership facilitating social relationships and an interchange of ideas with the students of various programs of nursing education throughout the state and nation.

Undergraduate Program of Study

Undergraduate Program of Study

Admission Requirements

NEW students are admitted for the academic year at the opening of school in the fall.

Candidates may qualify for admission as members of the freshman class or as students with advanced standing. Since the enrollment is limited, the Committee on Admissions selects students who, in its judgment, are best qualified to benefit from the educational advantages which the school offers. Selection is based on the academic record of the candidate, on test scores, and on satisfactory evidence of good character and general fitness for college life at Duke. A visit to the campus for a personal interview with members of the faculty is of material benefit to the candidate and to the Committee.

ADMISSION TO THE FRESHMAN CLASS: A candidate for admission to the freshman class must present at least fifteen acceptable units of secondary school credit. A minimum of twelve units must be in college preparatory subjects, but it is recommended that fifteen be offered. Subjects classified as college preparatory are English, foreign language, history and social studies, mathematics (Algebra and Geometry), and sciences.

Students applying for admission are required to take the Scholastic Aptitude Test, the English Composition test, and two other achievement tests of their own choosing given by the College Entrance Examination Board.

Prospective students are urged to broaden their reading outside of class during their senior year and to make the acquaintance of books and magazines that do not form part of the subject matter of their courses. At the same time, they should take every opportunity to increase their competence in writing. Those who cannot write simple, clear, grammatical English prose will be progressively at a serious disadvantage in the competition for admission and also in the general work of the Freshman year. Careful attention to correctness in English in correspondence and on application blanks cannot be too seriously stressed for candidates for admission.

EARLY DECISION PLAN: For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on December 1 of the student's senior year in secondary school. The deadline date for completing

applications for December decision is November 1. Interested students should write to the Office of Admissions for detailed information.

REGULAR ADMISSION: Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group, decisions are mailed by April 15.

Candidates for admission to the School of Nursing should address their inquiries to the Office of Admissions, Duke University, Durham, N. C., 27706.

A candidate for admission who wishes to arrange an interview should do so through the Office of Admissions.

Specific Requirements for Admission

I. All applicants for admission to the School of Nursing must present at least fifteen acceptable units of secondary school credit. A unit of credit is allowed for a course of study pursued throughout an academic year at an accredited secondary school, if the course has been completed satisfactorily.

1. Twelve units must be in English, foreign language, history and social studies, mathematics, and natural science; and must include:
   (a) English—3 units.
   (b) Algebra—1 unit.
   (c) Plane geometry—1 unit.
   (d) Chemistry—1 unit.
2. The three remaining units are elective and may be selected from those subjects for which the school allows credit toward graduations; but they should also be selected from the five subject fields listed above.

Other units offered in subjects not included in this list will be considered for acceptance on the basis of full statements transmitted with the applicant's record from the school recommending her.

II. Applicants are advised to have their scores on the Scholastic Aptitude Tests and the scores on three achievement tests of the College Entrance Examination Board submitted to the office of Admissions of the School of Nursing.

III. All applicants must supply references from at least three persons, two of whom must be recent high school or college instructors.

Graduate nurse applicants should submit one reference from a faculty member of the School of Nursing from which they were graduated and if applicable, from an employer.

IV. Interviews with members of the Duke University School of Nursing faculty are desirable and are encouraged.

V. Evidence of good health will be requested after the applicant is considered for acceptance. Final acceptance will be contingent on a complete physical examination during the week of Orientation. This examination also includes a chest x-ray, blood and urine studies and skin tests.

Admission to Advanced Standing

Admission by transfer from other institutions may be arranged for a limited number of students, under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal, and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students may not apply for transfer beyond admission to the junior class. Further detailed regulations for admission by transfer may be obtained from the Office of Admissions.

Applicants for advanced standing in the School of Nursing should present, as far as possible, subjects corresponding to those required by the School. They may not, during their first semester, register for more than the minimum number of hours required of the class which they enter, except by permission of the Dean of the School of Nursing.

Graduate nurses applying for admission to advanced standing are required to submit records of previous performance in Nursing, scores on the Scholastic Aptitude Tests and three Achievement Tests.

TRANSFER CREDITS. Transfer credit, in which grades of C or above have been earned, is rated at two quality points per semester hour. Courses in which grades of less than C have been earned are not acceptable for credit.

Although credit for work completed at other institutions will be determined in relation to the curriculum requirements of the School of Nursing, an overall average grade of C on all previous work taken is required before consideration for advanced standing may be given.

A student who transfers with advanced standing to the School of Nursing from a junior college must be enrolled for at least one semester before transfer of credit will be accepted. Credit for courses in science offered for advanced standing by a transfer from a junior college will be determined by the departments concerned.

The maximum amount of credit acceptable from a junior college is 60 semester hours, exclusive of physical education. No credit is given for work completed by correspondence, and credit for no more than six semester hours is allowed for extension courses. Any extension work accepted must be approved by the dean.

SPECIAL STUDENTS: Graduate nurses may be admitted for special work in such courses of instruction as their earlier training and experience may qualify them to take. They may not be admitted as candidates for a degree in the regular course of study unless they are able to meet all normal requirements for admission, which apply to all beginning students.

READMISSION OF FORMER STUDENTS: Former students who have for various reasons withdrawn from college and who wish to continue their collegiate careers should apply to the Duke University Office of Admissions with a detailed account of their activities since withdrawal from college.

Financial Information and Living Accommodations for Undergraduate Students

FEES PAID by students cover only a part of the cost of their instruction and of the operation of the University. Income from endowment and contributions from the alumni, alumnae, and other public spirited men and women meet the balance, which constitutes more than half the total cost.

Estimated Expenses

	1st year (2 sems)	2nd year (2 sems)	3rd year (2 sems)	4th year (2 sems)	Summer Sessions§
Tuition	$1250.00	$1250.00	$1250.00	$1250.00	
General Fee	187.00	187.00	187.00	187.00	
Room Rent	285.00	285.00	285.00	285.00	$ 46.50-$ 93.00
Board	450.00	450.00	*	*	75.00- 150.00
Laundry (approx.)	20.00	20.00	20.00	20.00	3.00- 6.00
Books (approx.)	40.00	40.00	40.00	10.00	10.00- 20.00
Activities (Student Government)	15.00	15.00	15.00	15.00	
Uniforms (approx.)	36.00	51.00			
Room Key Deposit	1.00				
Travel				15.00	
Locker Rental		1.00	1.00	1.00	
	$2284.00	$2299.00	$1798.00	$1783.00	$134.50-$269.00

* No board charges will be made for Junior and Senior students beginning September 1965. These students will pay for meals on a "pay by the meal" basis. Board costs may be estimated at $60 per month.

§ Charges for Summer term for each of first three years.

The tuition of $625.00 and the general fee of $93.50 are due and payable not later than the date of the beginning of a particular semester. No refund of the tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

Beginning the third year, qualified students may secure additional supervised training by performing services during hospital assignments in patient care. Such students receive awards commensurate with service performed.

New students, on notification of acceptance, are required to pay a non-refundable matriculation fee of $20.00 and to make a deposit of $50.00. The $50.00 deposit will not be refunded to accepted ap-

plicants who fail to matriculate. For those who do matriculate, $25.00 of the deposit serves as a continuing room deposit for successive semesters, and the remaining $25.00 as a continuing registration deposit. Arrangements for refund for $25.00 room deposit are described in information furnished each resident student by the Director of Housing. The $25.00 registration deposit will be refunded to students (1) whom the University does not permit to return, (2) who graduate, or (3) who request the refund at the time of pre-registration, thus indicating their intention not to return for the following semester. The registration deposit will not be refunded to students who pre-register and fail to enter the following semester on schedule.

Students who have been re-admitted to the University after an absence of one or more terms on notification of re-admission, are required to make the $50.00 room rent and registration deposit.

Undergraduate students are required to live in the School of Nursing residence houses unless they are married or are living with parents or relatives. Any exception must be approved by the Dean. Rooms are rented for a period of not less than one semester. No refund of room rent will be made to a student who withdraws from the residence halls.

The dining facilities available to students in the School of Nursing include the Medical Center and West Campus Cafeterias for upperclass students; the Hospital and Graduate Center Cafeterias and the East Campus Union for freshman and sophomore students. Sophomore and freshman students may not board at other than the places specified. The charge for board is payable, not later than the date of the beginning of each semester, also at the beginning of summer session. Students will not be entitled to a refund on board after the dates of the Fall or Spring mid-semester. (See Calendar.) Junior and senior students will not be required to pay Board fees beginning in September 1965. These students may purchase meals at any of the dining facilities located on West campus.

Part time special students who register for no more than two courses with a maximum total credit of eight semester hours are charged a registration fee of $5.00 for each course and $42.00 for each semester hour. Registration for 9 or more semester hours or 3 or more courses, requires payment of full fees.

Auditing of one or more courses without charge is allowed students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for not less than 3 nor more than 8 semester hours may audit other courses by payment of $21.00 for each course audited. Auditors submit no daily work, take no examinations, and receive no credit for courses audited.

One transcript is issued free of charge. Additional copies are supplied at $1.00 each.

No records are released and no student is considered by the faculty as a candidate for graduation until she has settled with the Treasurer for all indebtedness.

Bills may be sent to parents or guardians provided the Treasurer has been requested in writing to do so. Failure to pay bills on or before the due dates will debar the student from class attendance until the account is settled in full.

Living Accommodations

Hanes House and Hanes House Annex are residence houses for School of Nursing students. A counselor and her assistants, who are members of the Dean's staff, live in the respective houses. The counselors, with the cooperation of the Student Government Executive Council, are responsible for the administration of the houses.

Undergraduate students are required to live in the residence houses unless they are married or are living with parents or relatives. Any exception must be approved by the Dean. Rooms are rented for the academic or calendar year, but for a period of not less than one semester. No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

The rental charge for a single room is $335.00 for an academic year or $167.50 per semester or $465.00 per twelve month period. The rental charge for a double room is $570.00 for an academic year or $142.50 per person per semester, or $790.00 per twelve month period or $395.00 per person for twelve months period. The rental charge for a single room for a summer session term is $55.50; the rental charge for a double room for a summer session term is $93.00 or $46.50 per person.

Regulations governing the occupancy of rooms will be supplied by the Director of Housing to those students making application for housing. Occupants are expected to abide by these regulations.

Room reservations are made with the Director of Housing. An applicant who has been officially accepted as a resident student is assigned a room according to an established plan. The initial $25.00 room deposit is effective for the entire college course of the student whose attendance during regular terms is continuous. The deposit will be refunded to resident students under the following conditions: (a) within thirty (30) days after the student has been graduated, (b) upon student's withdrawal from the University residence halls provided a written notice is received by the Director of Housing by August 1 for cancellation of reservation for the fall semester and not later than January 15 for cancellation of reservation for the spring semester, (c) when the reasons requiring withdrawal are beyond the student's con-

trol. No refund is made until the occupant has checked out of her room through the Housing Bureau and has settled all her accounts with the Bursar.

The Director of Housing with the assistance of the Orientation Committee selects a roommate for a new student who is assigned to a double room but has made no arrangement for a roommate. After a student has been in residence for one semester, she is responsible for obtaining and keeping a roommate if she continues to occupy a double room. If a student occupying a double room does not obtain a roommate within a period of seven (7) days after written notice has been sent from the Director of Housing, she may be required to pay the rental consideration for the whole room.

After a student has engaged a room she is not permitted to move to another without the consent of the Director of Housing. A student leaving one room and occupying another without permission may be charged for both rooms for the entire semester. No student is allowed to rent or sublet her room to another occupant.

Residence hall rooms are reserved by upperclass students in accordance with the plan that is published during the school year. All rooms that have not been reserved on or before the announced date will be considered vacant for the succeeding semester and will be assigned to others.

The rooms are equipped with only the principal articles of furniture. Each student provides her own linens, blankets, bedspreads, and curtains. She may supply additional articles, but large rugs and additional furniture which make cleaning difficult are prohibited.

Scholarships, Loans, Grants-in-Aid

SCHOLARSHIPS: Scholarships intended to recognize outstanding students are awarded annually to candidates who evidence qualities which give high promise of excellence in Nursing.

Candidates for competitive scholarship prizes should initiate applications during the fall semester of the senior year of study in secondary school. Instructions concerning the specific requirements and deadline dates will accompany the application materials sent to applicants for these awards.

All candidates for scholarships are required to take the Scholastic Aptitude Test and three Achievement Tests; English Composition is required as one of the three Achievement Tests of the College Entrance Examination Board in order to qualify for consideration by the Scholarship Committee. The test must be taken either in December or January prior to the September in which admission is sought.

AWARDS: A maximum of eleven scholarships will be awarded annually without reference to geographical area.

ELIGIBILITY: A student must be accepted for enrollment to the freshman class of the Duke University School of Nursing in the ensuing academic year to be eligible for consideration for a scholarship award.

OBJECTIVE: These awards are scholarships based on merit. They are intended to encourage young women who give promise of becoming leaders in the field of nursing. Financial need is not a factor in making the awards. The size of the stipend assigned to each winner, however, will vary to some extent with the financial circumstances of the recipient. The honorary stipend for students needing no assistance will be $200.00 annually, while the stipend may be as large as $1200.00 for the students who need maximum aid.

BASIS OF AWARDS: The Scholarships will be awarded on the following basis:

1. Secondary school scholastic record (candidates will be restricted to the highest quarter of their classes).
2. College aptitude as shown by tests, particularly the Scholastic Aptitude Test and the Achievement Tests of the College Entrance Examination Board.
3. Breadth of interests and native ability as indicated by extracurricular activities.
4. Participation in church, civic, and other organizations with particular reference to the demonstration of qualities of leadership.

DURATION OF AWARD: The award will be made for one year renewable for a second year on the condition that the holder maintain a scholastic average in the top quarter of her class or a "B" average, and further that she show evidence of developing the qualities of leadership which served as the basis for the original selection. The maximum duration of the award will be two years.

METHOD OF SELECTION: A scholarship Committee of Duke University faculty members will select the winners and alternates on the basis of the applications submitted. All applicants for scholarship will be notified of their eligibility for competition by March 15, 1965.

PROCEDURE: All candidates for Duke University School of Nursing Scholarships and grants-in-aid who wish to be considered for awards on the basis of their financial circumstances are required to complete the Parents' Confidential Statement of the college scholarship service. This statement may ordinarily be obtained from the high school guidance counselor or principal. Application for scholarship must be submitted by January 1 to the Office of Admissions, Duke University School of Nursing, Durham, North Carolina.

GRANTS-IN-AID: Although sufficient funds are not available to assist all applicants who present requests for aid, a number of grants-in-aid are made each year to able students who need financial assistance in order to meet the cost of attending college. Any candidate for admission, therefore, who considers herself to be in such need is eligible to apply for a grants-in-aid.

Applicants for grants-in-aid will be required to submit a detailed statement of financial resources.

The following scholarship fund is available to nursing students who apply for grants-in-aid.

FLORENCE K. WILSON SCHOLARSHIP FUND: Established in 1961 by combining the Nurses' Alumnae Association Scholarship Fund, the students' Florence K. Wilson Scholarship Fund and contributions from the Wilson family and friends; the income to be used for scholarships for students enrolled in the School of Nursing.

REMISSIONS OF TUITION: Certain students attending Duke University are entitled to a remission of the University tuition charge. Students in this group are entitled to a maximum of eight semesters of free tuition at the undergraduate level. Each Summer Session in which work is taken and each semester spent in another institution will be counted as one of the eight allowable semesters. Only those students enrolled in the regular Nursing School program leading to a Bachelor of Science degree in Nursing are entitled to a remission of tuition charge.

Children of ministers who are members of the North Carolina or Western North Carolina Conferences of the Methodist Church are entitled to a remission of the University Tuition charge, as are the children of ministers of all faiths residing in Durham County, North Carolina. This consideration is given only to children of resident members of the two North Carolina conferences who are giving their full time to religious work.

TUITION GRANTS: Tuition grants are given to the children, step-children, and adopted children of certain qualified staff members of Duke University.

LOANS: Since the attainment of college education, like the purchase of a home, is an expensive undertaking students may find it necessary to borrow a portion of the funds required. Duke University has student loan funds available which supplement the program of scholarships and grants-in-aid. All candidates for loans must make a minimum grade of "C" in the semester preceding their application for a loan. Freshmen, therefore, will ordinarily be recommended by the University Scholarship Committee for a student loan which will not exceed the amount of tuition for the second semester.

Loans are granted from the Joseph F. Stein Student Loan Fund by the University Loan Committee upon the recommendation of the Dean of the School of Nursing. This fund was established to provide a means of assistance to students to meet pressing financial problems. The amounts to be loaned are limited in size and will not be charged interest rates if paid prior to termination of the program or if the student completes her program. Should a student, with an outstanding loan, withdraw from the school before she has completed her program, interest will accrue at 3% per annum for the first five years; 6% per annum after 3% ceases to be effective. Monthly payments shall be made on the first day of the next following October and continuing on the first day of each month thereafter of at least two per cent of the amount of the principal balance on the June 30th next prior to the date on which the first such monthly payment becomes due.

Army and Navy Nurse Corps Student Program

Students in the Basic Nursing Programs may apply for appointments in the Army Student Nurse Program at the beginning of their Junior year, or the Navy Nurse Corps Candidate Program at the beginning of their Senior year. The appointments carry generous financial allowance. A student who participates twelve months or less serves on active duty in the respective service for 24 months. If 2 years support has been given, she serves 36 months.

Graduate Nurse Students enrolled in the Undergraduate Program may apply for the same appointment in the Army Student Nurse Program if they have completed their diploma program within the past 30 months and are able to complete the requirements for their degree within 24 months.

These opportunities are open only to students enrolled in programs accredited by the National League for Nursing.

Psychiatric Nursing Undergraduate Training Grant Awards

A limited number of Psychiatric Nursing Undergraduate Training Grant Awards are available to qualified Junior and Senior students.

An award provides for an annual stipend plus tuition fees.

Additional information about the Psychiatric Nursing Undergraduate Training Grant Awards may be secured in the Dean's office.

To qualify for an award, the student must have an above average academic record and the potential for admission to graduate study, and must declare intent to pursue a career in the field of Mental Health.

General Regulations Undergraduate Students

Orientation Program

ALL FRESHMEN and transfer students are required to participate in the activities of Orientation Week. The program includes placement tests, orientation lectures, physical examinations, social events, special religious services, registration, and enrollment. New students who miss the whole or a part of the Orientation Program place themselves at a serious disadvantage at the very outset of their college career.

Registration

Students who register in either semester at a date later than that prescribed must pay to the Treasurer a fee of $5.00. Changes in courses for reasons not arising within the University require a payment of $1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

Health Regulations

Before admission to the School of Nursing, a student is required to have a physical examination by the family physician and to be immunized against typhoid fever, diphtheria, tetanus, smallpox and poliomyelitis. Physical defects, such as defective vision, dental needs, etc., must be corrected before admission.

Before final acceptance, each student is required to undergo a physical examination under the School's direction during Orientation. Students whose condition needs further observation may be admitted tentatively, but must cancel their applications if findings prove them physically unable to pursue the program.

General Academic Regulations

QUANTITY CREDIT AND COURSE LOAD: The term of credit used is the semester hour which signifies one class period a week

throughout the semester. Two or four hours of laboratory work are equivalent to one hour of class work. Two semesters of seventeen weeks each or three quarters of twelve weeks each constitute the academic year. For the degree of Bachelor of Science in Nursing, credit for 135 semester hours is required.

The normal load of a student is four or five academic and professional courses totaling 15 to 19 semester hours per semester during the freshman and sophomore year or 6 to 9 semester hours per quarter during the junior and senior years, exclusive of physical education. No student is permitted to take less than 14 semester hours of work per semester during the freshman and sophomore years or 6 semester hours per quarter during the junior and senior years or more than the normal load during any part of her program without special permission from the dean.

QUALITY CREDIT: The requirements for the degree are computed in semester hours and in quality points. Quality points are determined by grades as follows: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points. Credit for at least 270 quality points is required for the degree of Bachelor of Science in Nursing.

REQUIREMENTS FOR CONTINUATION IN COLLEGE AND FOR GRADUATION FROM COLLEGE: To continue in college and to graduate, students must, in addition to the requirements listed elsewhere in this Bulletin, pass a minimum number of semester hours, achieve a specified quality point ratio, and in the case of graduation earn a minimum number of quality points. The quality point ratio is calculated by dividing the accumulated number of quality points earned by the accumulated number of semester hours carried (not semester hours passed). These requirements are listed in the following table.

For continuation from	The minimum requirement is
The first to the second year	24 s.h. credit and a q.p.r. of 1.30
The second to the third year	56 s.h. credit and a q.p.r. of 1.60
The third to the fourth year	80 s.h. credit and a q.p.r. of 1.75
The fourth to the fifth year, if needed	114 s.h. credit and a q.p.r. of 1.85

For graduation the minimum requirement is 135 semester hours, 270 quality points and a quality point ratio of 1.9.

In addition to the qualitative standards listed above students must pass a minimum number of hours each semester. Freshmen must pass at least 6 semester hours of work in their first semester and 18 semester

hours in their first year exclusive of physical education; all other students must pass at least 9 semester hours each semester. Junior and senior students are expected to maintain a "C average" in nursing. The University may require a student whose record is considered unsatisfactory to withdraw, although the minimum requirements set forth in this paragraph have been met. Any student whose standing in the School of Nursing indicates that she is performing below an acceptable level (minimum requirements) in either her academic or clinical courses, will be (after careful evaluation by the faculty) placed on probation. Both the student and her parents will be appropriately notified of this action.

Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, reports on freshmen are mailed at each mid-semester period.

CLASS STANDING: Students to rank as sophomores must have to their credit at least 26 semester hours and 52 quality points; and must have passed certain designated courses relating to their major; as juniors, at least 56 semester hours and 112 quality points and must have passed those courses relating to and including the nursing major; and as seniors, at least 90 semester hours and a quality point ratio of 1.75 and must have passed those courses relating to and including the nursing major.

Academic Honors

DEAN'S LIST: In recognition of academic achievement, students who earn an average quality point ratio of 3.0 or higher on a semester's work of not less than the minimum academic load are placed on the Dean's list.

CLASS SCHOLARS: A student in each class of the School of Nursing who achieves the highest quality point ratio on at least a normal course load for each academic year shall be designated a Class Scholar.

CLASS HONORS: To be eligible for Class Honors a student must earn, during the year, credit for at least the minimum academic load permitted by the college in which he is registered. All semester hours on which a student receives a grade are counted in the determination of Class Honors. Students in the freshman, sophomore and junior classes who earn a 3.50 quality point ratio are eligible for Class Honors.

GRADUATION HONORS: To be eligible for consideration for Graduation Honors at graduation a student must have completed in residence a minimum of ninety semester hours. Students who earn an average of at least a quality point ratio of 3.50 are recommended for

a degree magna cum laude. Those who earn a quality point ratio of 3.75 are recommended for a degree summa cum laude.

Awards to Undergraduate Students

DUKE UNIVERSITY SCHOOL OF NURSING ALUMNAE AWARD: The Duke University School of Nursing Alumnae Award is presented to a graduating student by the Alumnae Association for leadership, scholarship and nursing skill.

THE MOSELEY AWARD: The Moseley Award of $25.00 is given to the student in the senior class who has shown the most skill in Nursing Arts throughout her program in the School of Nursing.

RESIDENCE REQUIREMENTS

The final two years of senior-level work in the School must be earned in residence. Students who meet this requirement but who still lack 6 or 8 semester hours in final fulfillment of requirements may take this work in another institution of approved standing, provided the course is approved by the head of the department concerned and by the Dean.

Students who complete in a summer session the work required by the University for the degree will be granted the degree at the end of the summer.

GRADING AND EXAMINATIONS

Grading: Grades are reported to indicate the following:

(1) Passed. A, B, C, and D are all passing grades. The letters are intended to indicate the following quality of work. A, exceptional; B, superior; C, average; D, low pass.

(2) Failed. A grade of F indicates that the student has failed the course, and in order to receive credit for the course she must repeat the work in class.

(3) Incomplete work. If because of illness or other emergency a student's work in a course is incomplete, she may receive an I for the course instead of a final grade. Incomplete courses must be completed before the close of the succeeding semester; otherwise the I is converted to an F and the course must be repeated in class if the student is to receive credit for it. In case a student whose work is incomplete is also absent from a final examination, she receives an X for the course.

(4) Withdrawal. The letter W is used to indicate official withdrawal from a course. If a student drops a course without permission from the Dean, the grade for that course is recorded as F. If she drops with permission a course in which she is failing, the grade for that course is

recorded as F unless, in the judgment of the Dean, circumstances do not justify this penalty.

REPORTS: Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, six-weeks advisory grade reports on freshmen are mailed each semester.

Class Attendance Regulations

General regulations for all students enrolled in nursing and nursing related courses.

(1) In all nursing courses, students may take a ratio of unexcused non-consecutive absences in the proportion of one absence per semester hour, no more than one third of which may be taken from laboratory hours. However, instructors may specify certain required classes and/or laboratories from which no unexcused absence may be taken; such absences would be considered as excessive, unexcused absences.

(2) Unexcused, consecutive absences, whether excessive or not, result in the loss of quality points as in the case of unexcused, excessive absences.

(3) When the student has incurred twelve absences, excused and unexcused, in any course she is required to drop the course unless the Dean and the instructor concerned grant special permission for her to continue in the course. (In a course of less than 3 s.h. a student may incur absences not to exceed ¼ of the class hour.)

(4) The first three tardies in a given course are counted as one absence. Thereafter, each additional tardy is counted as one additional absence.

(5) All absences taken immediately before and after announced holidays, holiday recesses, and/or vacation result in the loss of two quality points for each absence in each class.

(6) Each excessive or consecutive absence results in the loss of quality points as follows: one quality point for the first absence, two additional for the second, and three additional for the third. When the third unexcused, excessive or consecutive absence occurs, the student is debarred from the course with a loss of 6 quality points and an "F" in the course.

For Junior and Senior students with a grade average of 3.0:

Responsibility for punctual and regular class attendance is placed upon Junior and Senior students who, in a normal schedule earn grade average of 3.0 or above in the preceding term. They will be subject to no fixed absence limitations except for the specified re-

quired classes and for absences immediately before and after announced holidays, holiday recesses and/or vacations for which the usual consequences will apply. Instructors are expected to refer to the Dean for appropriate action, any student who in their opinion is causing her work or that of the class to suffer because of absences or tardies.

Regulations for all students enrolled in general courses:

A student is expected to attend class meeting regularly. Since, however, the University intends that the matter of class attendance shall be primarily the student's responsibility, no limitation of absences per course is prescribed. However, it should be recognized that one of the most vital aspects of a residential college experience is attendance and participation in the classroom, and that the value of this academic experience cannot be fully measured by testing procedures alone. Students are considered sufficiently mature to demonstrate the kind of self-discipline and personal responsibility required under the non-compulsory system. The student must recognize and accept the consequences, if unwilling or unable to live under such a system.

Other Regulations

CONDUCT AND DISCIPLINE: The University expects of its students loyal and hearty cooperation in developing and maintaining high standards of conduct as well as of scholarship. General University regulations concerning conduct of students will be made available to students when admission is offered, or under other circumstances, upon request. The student in accepting admission indicates a willingness to subscribe to those regulations. The University therefore reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory to the University, even though no specific charge may be made against the student.

General oversight of the conduct of students and the administering of discipline are under the supervision of the Vice-President in the Division of Student Life. Immediate supervision is entrusted to the Dean. However, through the expressed willingness of the students of the University to assume the responsibility of maintaining high standards of morals and honor, the student body has properly become to a great degree self-governing. The duly elected representatives of the student body, exercise the authority granted the students to investigate all cases of misconduct, as well as all other cases of violation of proper student standards and traditions, and to make recommendations of penalties based on their findings. They exert a guiding and

stimulating influence for the promotion of high ideals of conduct and of student relationships.

MOTOR VEHICLES: Freshmen are not advised to own or operate motor vehicles at the University. Members of the upper classes may operate motor vehicles, however, when in accordance with University regulations.

Each student possessing or maintaining a motor vehicle at Duke University shall register it annually at the beginning of the fall semester. If a student acquires a motor vehicle and maintains the same at Duke University after enrollment, he must immediately register it. Resident students are required to pay an annual parking fee of $30.00 for each automobile.

At the time of registration of a motor vehicle, the following documents must be presented:

(a) State vehicle registration certificate.

(b) Valid driver's license.

(c) Satisfactory evidence of automobile liability insurance coverage with limits of at least $5,000.00 per person and $10,000.00 per accident for personal injuries and $5,000.00 for property damage, as required by North Carolina Motor Vehicle Law.

(d) If the student is under 21, a statement signed by the student's parent or guardian granting the student permission to operate a motor vehicle at Duke University.

ENROLLMENT AND REGISTRATION: Students in residence are required to submit, not later than the date of the spring registration, cards showing their selection of courses for the following year. Evidence of the payment of the continuing preregistration deposit of $25.00 is required before the card may be submitted. These cards, approved by the dean, are filed for permanent record in the Central Records Office. Students who do not select their courses for the following year at the time appointed must be readmitted to the college by application to the Committee on Admissions. The same regulations, with the exception of the advance deposit, apply to registration for the spring semester.

Students who register in either semester at a date later than that prescribed must pay to the Treasurer a fee of $5.00. They are counted as absent in the work they have missed in the professional courses to which they are admitted, and these absences carry the same penalty as do other absences from the professional courses. Changes in courses for reasons not arising within the University require a payment of $1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

FIRST AID COURSE

All students are advised to complete a Standard Red Cross First Aid Course before the date of enrollment in the School of Nursing. For those students who will find it impossible to complete such a course in their home communities, the local Red Cross Chapter will offer this course at the School of Nursing. Because of the heavy course load, the student will be at a disadvantage in planning to complete the course at the School of Nursing.

Requirements for Degree

BACHELOR OF SCIENCE IN NURSING

THE SCHOOL OF NURSING offers a program which is planned to cover a period of four years; four academic years and three summer terms. At the completion of this program, the student receives the degree of Bachelor of Science in Nursing and is then eligible for the examinations given by the North Carolina State Board of Nurse Examiners.

The School of Nursing offers to carefully selected persons a program based on experiences which are designed in sequential patterns to promote a concatenation of learning and growth. Classes are kept small and close contact with the instructor is encouraged. Whether in the classroom, hospital, laboratories, community, or in the extra-curricular activities, the development of the student's physical, mental and social well-being is the primary consideration of the faculty.

Graduates of the program are prepared as professional nurses for beginning positions in nursing and have the competencies and theoretical preparation on which to build further knowledge.

To fulfill the requirements for the degree of Bachelor of Science in Nursing, a student must complete the program with a C average, must complete 135 semester hours as outlined below, earn 270 quality points, and show proficiency in the practice of nursing.

The requirements for the degree of Bachelor of Science in Nursing are based on the principle that the student will derive the maximum benefit if the program includes a broad distribution of studies among representative fields.

For graduation with the degree of Bachelor of Science in Nursing, the following course work or equivalent must be completed.

These requirements are described in detail below.

Uniform Course Requirements	s.h.
Natural and Biological Science	18-21
Social Sciences	24
English	6
Elective (Religion, Literature, Music, Art, or Philosophy)	12
Physical Education	2
Major (Nursing and related work)	68
Total	133

ENGLISH, 6 s.h.—This requirement is met by the completion of English 1-2.

NATURAL AND BIOLOGICAL SCIENCE, 20 s.h.—To satisfy this requirement a student must complete laboratory courses in Physiological Chemistry (3 s.h.),

Zoology, Botany, Chemistry or Physics (8 s.h.), Anatomy and Physiology (4 s.h.), and Microbiology (3 s.h.).

RELIGION, 6 s.h.—To meet this requirement 6 semester hours may be chosen from Religion 1-2, 51-52, 55, 65, 85, 93.

SOCIAL SCIENCE AND HISTORY, 24 s.h.—The following courses will satisfy this requirement: Education 118, Psychology 91 and 116; and Sociology 91, 92, and 150. The remaining 6 s.h. may be selected from History (students who do not present for entrance 2 acceptable units of History must select History), Political Science 11-12, or 61-62, or Economics 51-52.

LITERATURE, MUSIC, ART, AND PHILOSOPHY, 6 s.h.—This requirement can be satisfied by a total of 6 semester hours in courses in English or American literature, Greek literature, foreign literature courses, literature courses in translation, courses in aesthetics, art, music, and courses in Philosophy (except 48, 103, 104, 109).

PHYSICAL EDUCATION, 2 s.h.—In the School of Nursing, Physical Education is required during the first year and must be completed by the end of the first year.

MAJOR AND RELATED WORK, 68 s.h.—This requirement is met by completing courses in the School of Nursing in accordance with the regulations described.

To complete the requirements in the regular period (four years) of study, the work is planned as follows:

FIRST YEAR

English 1-2	English Composition	6 s.h.
History 1, 2 or Political Science 11-12	Modern History / The American System of Government	6 s.h.
Elective		6 s.h.
Nursing 1-2	Interpersonal Relations in Nursing	4 s.h.
Zoology 1-2	Animal Biology, General Zoology	8 s.h.
Microbiology 4	Microbiology	3 s.h.
Chemistry 50	Chemistry	3 s.h.
Psychology 91	Introductory Psychology	3 s.h.
Physical Education		2 s.h.
		41 s.h.

SECOND YEAR

Nursing 52	Human Anatomy and Physiology	4 s.h.
Chemistry 51	Physiological Chemistry	3 s.h.
Nursing 91-92	The Fundamentals of Nursing	13 s.h.
Sociology 91, 92	General Sociology	6 s.h.
Nutrition 53	Nutrition and Diet Therapy	3 s.h.
Education 118	Educational Psychology	3 s.h.
Elective		6 s.h.
		38 s.h.

THIRD YEAR

Nursing 120	Pediatric Nursing	6 s.h.
Nursing 130	Obstetric Nursing	6 s.h.
Nursing 141	Medical-Surgical Nursing Principles	5 s.h.
Nursing 142	Medical-Surgical Nursing Practicum	4 s.h.
Nursing 155	Social Forces and Community Health	3 s.h.
Sociology 150	The Family	3 s.h.
Psychology 116	Psychology of Adjustment	3 s.h.
Nursing 180	Public Health Sciences	3 s.h.
		33 s.h.

FOURTH YEAR

Nursing 160	Social Foundation of Nursing	3 s.h.
Nursing 170	Psychiatric Nursing	6 s.h.
Nursing 181	Public Health Nursing	6 s.h.
Nursing 190	Medical-Surgical Nursing	6 s.h.
		21 s.h.

Description of Courses

EDUCATION

118. EDUCATIONAL PSYCHOLOGY.—A study of psychology of learning; individual and social development; and psychology of adjustment, as related to problems of instruction and the processes of education. Prerequisite: Psychology 91. 3 s.h. THORNTON

ENGLISH

1-2. FRESHMAN COMPOSITION.—Training in composition through the writing of weekly expository themes. The theme subjects derive from assigned reading drawn from British and American literature of the 20th Century. English 1 takes up the Essay, the Short Story, and the Novel; English 2, the Play and the Poem. The student attends each week (1) a general lecture on the reading for the week; (2) a section meeting, where the instructor and a small group discuss problems of composition and literature; and (3) an individual conference in which the instructor reads and grades the weekly theme and makes special assignments according to the needs of the student. 6 s.h. STAFF

ENGLISH AND AMERICAN LITERATURE AND LANGUAGE

55, 56. REPRESENTATIVE BRITISH WRITERS.—The following works are studied in the first semester: Chaucer's Prologue to (*The Canterbury Tales*) and at least two tales, Shakespeare's (*I Henry IV*), (*Hamlet or King Lear*), and one other play, John Donne's poetry (selections), (*Milton's Paradise Lost*) (selections) and some of the shorter poems; in the second semester: novels by Fielding (*Joseph Andrews*), Dickens (*Great Expectations*), and Hardy (*The Mayor of Casterbridge*), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 6 s.h. (E & W) STAFF

57, 58. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works. The first semester will include Poe, Emerson or Thoreau, Hawthorne, Melville, Whitman, Dickinson, and Twain; the second will include James, Frost or Robinson, Crane or Dreiser, O'Neill, Faulkner, Hemingway, and others. 6 s.h. (E & W) STAFF

HISTORY

1, 2. MODERN HISTORY.—This course is an introduction to the study of modern history with special reference to the issues in the modern world. Topics selected for emphasis are: the contest between liberty and authority in the modern state; changing economic organization and theory—capitalism and the challenges to it; the problems of peace and war among the states; the changing faiths men live and die by. Beginning about 1500 with the rise of the European dynastic states, the story is pursued in the first semester to approximately 1848, and in the second through the two great world wars. The central theme in both semesters is the expansion of the influence of Western Europe throughout the world, with some attention to the rise of the United States as a world power. 6 s.h. (E & W)

Sophomores and juniors are not admitted to this course.

PROFESSOR ROPP AND STAFF

51, 52. MODERN HISTORY.—An introductory course for sophomores, juniors and seniors dealing with the topics indicated in the description of course 1, 2. 6 s.h.

PROFESSORS PARKER AND ROPP; ASSOCIATE PROFESSORS ACOMB, HOLLYDAY, W. SCOTT AND YOUNG; DR. GINTER; MR. CELL

51X, 52X. MODERN HISTORY.—A special section for seniors who have had no other history at Duke and who wish a course in history before completing their college career. The topics covered will be essentially the same as those indicated in the description of course 1, 2. 6 s.h. Professor Ropp

PHILOSOPHY

41, 42. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include, in Philosophy 41, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. In Philosophy 42 these include the nature and ground of values, ultimate goals and moral obligation. (Philosophy 42 may be taken before, or with, Philosophy 41.) 6 s.h. Staff

POLITICAL SCIENCE

11-12. AMERICAN AND EUROPEAN POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. An introductory course for Freshmen dealing with the topics indicated in the description of Political Science 61-62. (Open only to Freshmen) 6 s.h. Associate Professor Hall; Assistant Professors Cheek, Finlay and Kearney; Messrs. Meekison and Zikmund

61-62. AMERICAN AND COMPARATIVE POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. The first semester is devoted to the study of American constitutional democracy. Topics examined include federal-state relations, the separation and interrelationships of the executive, legislative, and judicial branches of government, judicial review, the role of political parties and public opinion, the formulation and execution of domestic and foreign policy, civil liberties. The second semester is devoted to a study of constitutional democracy in Great Britain and France with emphasis upon the similarities and differences between those systems and our own. Detailed attention is also given to an examination of the theory and practice of totalitarian dictatorship as exemplified in the U.S.S.R. 6 s.h. (E & W)

Associate Professors Leach and Simpson; Assistant Professors Cheek, Howard, and Kearney; Messrs. Meekison, Washburn, and Zikmund

REQUIRED PHYSICAL EDUCATION

Two semester hours, to be completed in two semesters, are included in the 135 hours required for graduation. Students may elect activities in sports or dance with the possibility of four different choices in the year's requirement.

At the beginning of the freshman year, each student is tested in posture, rhythm, sports fundamentals, and swimming. For those whose test scores are low, remedial courses in these basic skills are suggested. A swimming course is required for those who do not pass the elementary swimming test.

Professor McCue, Chairman: Professors Bookhout and Lewis; Associate Professors Eddy and Holton; Assistant Professors Lloyd, Spangler, Woodyard, and Wray; Miss Raynor

PSYCHOLOGY

91. INTRODUCTORY PSYCHOLOGY.—An introduction to the facts, principles, and problems of normal adult psychology through a study of psychological methods as applied to motivation, emotions, perception, sensation, thinking, memory, learning, individual differences, and personality. 3 s.h. Staff

116. PSYCHOLOGY OF ADJUSTMENT.—The course is planned to give an adequate understanding of problems of adjustment and of mental hygiene. Lectures and discussions cover an application of the principles and findings of normal and abnormal psychology as these relate to the adjustment of the average individual in our changing society; a survey of the principles of mental hygiene; discussions of current socio-cultural trends significant for individual adjustment.

Not open to students who have had Education 68 or Psychology 100. 3 s.h. (W) Staff

RELIGION

The uniform course requirement in religion may be met in one of the following ways: (a) by completing, in the freshman year, Religion 1-2; (b) by completing, in the sophomore year or later, Religion 51-52; (c) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99.

Students who have fulfilled the uniform course requirement in religion are eligible to elect any course numbered 100 or above, except those for which additional prerequisites are prescribed. Courses numbered below 100 may not be taken by those who have completed the uniform course requirement in religion.

1-2. THE ENGLISH BIBLE.—A comprehensive survey of the books of the Old and New Testaments. The literature is examined in the light of its origin in the history and religion of the people of the Bible, in order that its theological significance in its own day and in ours may be understood. Open only to freshmen. 6 s.h. STAFF

51-52. THE ENGLISH BIBLE.—A survey of the Old and New Testaments, similar to Religion 1-2 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion 1-2. 6 s.h. STAFF

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 3 s.h. STAFF

65. JESUS: THE MAN AND HIS MESSAGE.—A detailed examination of the Gospel records, for the purpose of recovering the person and mission of Jesus. Attention will be given to conceptions of Christ in the history of the Church, and to his contemporary significance. Prerequisite: Religion 55. 3 s.h. PHILLIPS

85. INTRODUCTION TO CHRISTIAN ETHICS.—A brief analysis of the Biblical and historical bases for the Christian understanding of man's moral situation, followed by a study of the social implications of Christianity in such areas of life as marriage, race, the political and economic order, etc. Consideration is given to the relation of Christian ethics to moral philosophy. Prerequisite: Religion 55. 3 s.h. MCCOLLOUGH

93. SURVEY OF THE WORLD'S LIVING RELIGIONS.—An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, several of the major living religions are dealt with in terms of historical development and the beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55. 3 s.h. BRADLEY, PARTIN, AND SULLIVAN

SOCIOLOGY

91. INTRODUCTION TO SOCIOLOGY: CONCEPTS AND PROCEDURES.—Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. 3 s.h. Open to Freshmen. STAFF

92. INTRODUCTION TO SOCIOLOGY: SOCIOLOGICAL STUDIES.—Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 3 s.h. STAFF

150. THE FAMILY.—Analysis of the American family as an institutionalized group and its relationship with other institutions and structural features such as social class and ethnic group. Special attention is devoted to methods of research in this area. 3 s.h. KERCKHOFF

ZOOLOGY

1. ANIMAL BIOLOGY.—The principles of biology as applied to animals. 4 s.h. ASSOCIATE PROFESSOR KLOPFER AND STAFF

2. GENERAL ZOOLOGY.—A survey of the animal kingdom. Prerequisite: Zoology 1. 4 s.h. PROFESSOR BOOKHOUT; ASSOCIATE PROFESSOR HUNTER AND STAFF

HUMAN BIOLOGICAL AND PHYSICAL SCIENCE

N52. HUMAN ANATOMY AND PHYSIOLOGY.—A study of the normal structure and functions of the human body. 4 s.h.
Professors Tosteson, Markee and Staff

Chem. 50. CHEMISTRY.—A course in the fundamentals of general inorganic chemistry with particular emphasis on introduction to organic chemistry. 3 s.h.
Associate Professor Thiers

Chem. 51. PHYSIOLOGICAL CHEMISTRY.—This course is designed to aid the student in understanding the chemical mechanism of the human body both in health and in disease. The student also acquires knowledge concerning the chemical basis of diagnosis and therapy. 3 s.h. Associate Professor Thiers

Micro. 4. MICROBIOLOGY.—A survey of the principles and techniques of microbiology and immunology with special emphasis on their applications to nursing. 3 s.h. Dr. H. S. Nielson, Jr.

NURSING AND ALLIED ARTS

NI-2. INTERPERSONAL RELATIONS IN NURSING.—This is an introductory course which is designed to assist the student in further developing concepts and skills that are basic to competence in interpersonal relations and nursing therapy. The student begins to define and amplify her concepts of the role of the professional nurse. Content of the course is based on the belief that a conscious possession of interpersonal concepts and goal directed behavior is basic to professional management of nurse-patient situations. A limited number of supervised short interviews with in-patients is arranged. 4 s.h.
Assistant Professors Dunham, Culver, and Staff

Nutr. 53. NUTRITION AND DIET THERAPY.—This course considers the nutritional needs of individuals of varying ages and methods of meeting these needs under different economic and social conditions. Some accepted principles are presented on which dietary modifications are based, as are some practices based on these principles. 3 s.h. Associate Professor McLachlan and Staff

N91-92. THE FUNDAMENTALS OF NURSING.—A study of the fundamentals of patient care, aimed at giving the student a basic knowledge and understanding of the principles and skills of nursing care. The student has correlated experiences in patient care and has the opportunity to participate in patient-centered conferences. Both of these are designed to assist her in the process of integrating the concepts of the behavioral and the natural sciences in her approach to nursing care problems. Emphasis is placed upon developing therapeutic nurse-patient relationships. 13 s.h.
Assistant Professors Gover, Ahlgren; Misses Lawrence, Lesko, Nolan

N120. PEDIATRIC NURSING.—This course focuses on child care and the nurse-child-family relationship. This course is designed to help the student acquire knowledge, understanding and nursing skills which are necessary to assist in the promotion of comfort, health and safety of children. Laboratory experiences include observation and participation in the care of children in hospital and community. 6 s.h. Assistant Professor Horton; Misses Agner and Collins

N130. OBSTETRIC NURSING.—This course focuses on the nursing needs of mothers and newborn infants. This course is designed to help the student acquire knowledge and to develop understanding and nursing skills necessary to assist in the promotion of comfort, health, and safety of the mother and newborn infant during the reproductive experience. 6 s.h.
Assistant Professors Horton and Hogue; Mrs. Proctor

N141. MEDICAL-SURGICAL NURSING PRINCIPLES

N142. MEDICAL-SURGICAL NURSING PRACTICUM.—These courses are designed to assist the student in developing skills basic to identifying and meeting the nursing needs of patients with acute and chronic medical and surgical condi-

tions. Experiences are planned to increase the student's understanding of the need for continuity of nursing care and to enhance her ability to implement this as she cares for patients in various medical and surgical settings. These courses must be taken concurrently, and must be completed satisfactorily, to receive credit for either course. 5 s.h.: 4 s.h. ASSISTANT PROFESSORS HARRIS, CRANE AND STEELE
MISSES JANOSCRAT AND LEMMOND

N155. SOCIAL FORCES AND COMMUNITY HEALTH.—Analysis of community action designed to alleviate universal health, welfare and educational problems. Demonstrate the concomitance of social, economic and cultural patterns with social legislation. Course is to be taken concurrently with N141-N142. 3 s.h. ASSISTANT PROFESSOR HARRIS

N160. SOCIAL FOUNDATION OF NURSING.—A survey of major historical, philosophical, and sociological factors which have affected Nursing and Nursing Education. The purpose of the course is to give the student a better understanding of the place of nursing in present day society and the responsibilities of the individual nurse to society. 3 s.h. PROFESSOR JACOBANSKY
ASSISTANT PROFESSOR MORDAN

N170. PSYCHIATRIC NURSING.—This course focuses on dynamic psychiatric nursing. It is taught within the frame of reference of interpersonal theory, communication theory, problem solving process and dynamic psychiatry. It provides opportunities for learning under supervision through experiences in a one-to-one relationship with a hospitalized psychiatric patient. 6 s.h.
ASSISTANT PROFESSOR PARKS AND STAFF

N180. PUBLIC HEALTH SCIENCE.—This course offers a body of knowledge derived from the field of public health which includes an introduction to public health administration, environmental sanitation, bio-statistics and epidemiology. 3 s.h. Prerequisite to N181. ASSISTANT PROFESSOR CAMPBELL;
VISITING LECTURER

N181. PUBLIC HEALTH NURSING.--This course provides opportunities to develop the philosophies and to study the principles and processes of nursing in a public health setting, through classes and selected community nursing experiences with faculty guidance at the Durham County Health Department. 6 s.h.
ASSISTANT PROFESSORS CAMPBELL, PERSING, YOUNG
MRS. GADDY

N191. MEDICAL-SURGICAL NURSING.--The classes and clinical experiences are designed to consider the more complex nursing problems encountered in nursing care. Opportunities are also provided for the student to further develop her competencies in leadership skills and problem solving techniques. 6 s.h.
ASSOCIATE PROFESSOR FORTUNE;
ASSISTANT PROFESSORS WILSON, CADDELL, DAVENPORT

Graduate Program of Study

Graduate Program of Study*

General Regulations Governing

THE DEGREE of Master of Science is offered in the field of Medical and Surgical Nursing, Maternal and Infant Health, Pediatric Nursing and Psychiatric Nursing.

Admission

REQUIREMENTS FOR ADMISSION TO GRADUATE STUDY IN NURSING

1. Completion of an NLN accredited baccalaureate degree program in nursing which prepares for professional practice in all fields of nursing. (Provisional admission may be granted to applicants not fully meeting this requirement).
2. A record of undergraduate study that meets general standards for admission to graduate study at Duke University.
3. State registration for the practice of nursing.
4. Two recommendations from persons who are acquainted with the applicant's professional ability and capacity for graduate study.
5. NLN Graduate Nurse Examination scores will be requested prior to admission from applicants whose records are marginal.
6. Satisfactory health appraisal.
7. A personal interview may be required.

PROCEDURE FOR ALL APPLICANTS: Interested nurses should write to the Director of Graduate Studies, School of Nursing, Duke University, Durham, North Carolina. A brief biographical statement should be included in this letter. The nurse will be furnished an application form. In addition to the completed form the following supporting documents should be provided: (1) transcripts of all undergraduate and graduate work mailed directly by registrars; (2) two letters of recommendation written by persons qualified to judge the applicant's professional ability and capacity for graduate study; (3) a record of health appraisal; (4) evidence of registration to practice nursing; and (5) scores on qualifying examinations when requested.

DEADLINES FOR APPLICATIONS: The application and all supporting documents should be submitted to the Office of Admissions

* Not offered in 1965-1966.

not later than June 1 by those applying for the fall semester; before May 12 for admission to the first term of summer; and before June 18 for admission to the second term. It is the student's responsibility to make certain that her application is complete and in order before the dates specified. Students who are applying for Traineeship assistance are advised to assemble their credentials early in the calendar year in which they anticipate admission to graduate study.

NOTIFICATION AND STATUS: When the application is approved, the student will receive a letter of admission. The process of admission is not complete until a statement of acceptance has been returned by the applicant.

Applicants who are admitted will be offered either full admission or provisional admission. PROVISIONAL ADMISSION to one semester or a minimum of 12 hours of course work is offered to students who do not fully comply with admission requirements but appear to warrant admission. Graduate credit earned under *provisional status* may be applied toward an advanced degree at Duke University if and when upon review the student is granted full admission.

Registration

WHO MUST REGISTER. (1) All students who enter course work for credit; (2) all students who have completed minimum requirements for an advanced degree but continue to use the facilities of the University in their research.

REGISTRATION. After the applicant has received notification of admission and has submitted a statement of acceptance of admission, she is eligible for registration.

LATE REGISTRATION. All students are expected to register at the time stated. *Those registering later are subject to a late registration fee of five dollars.*

CHANGE OF REGISTRATION. During the academic year within a period of fourteen days from the specified day of registration, students may change their schedules with the approval of the Director of the Graduate Program.

Grades, Hours, and Credits

Although ideally graduate study is principally individual reading, research, and laboratory experimentation under guidance, academic progress in the United States is generally measured and recorded in terms of course hours and credits. Peculiar to graduate study is the term *residence,* also generally measured in hours, to designate indi-

vidual study apart from courses, such as writing a thesis and preparing for general examinations. Since September 1959 in this University, graduate credit for courses and seminars, research, and residence, and corresponding tuition and fees have been stated in terms of UNITS. According to conventional measurement ONE UNIT is equivalent to ONE SEMESTER HOUR. Thus a course previously described as carrying a credit of 3 s.h. now carries a credit of 3 units.

GRADES. Grades in the Graduate Program are as follows: *E, G, S, F,* and *I*. *E* (exceptional) is the highest mark. *G* (good) and *S* (satisfactory) are the remaining passing marks. *F* (failing) is below passing, and *I* (incomplete) indicates that some portion of the student's work is lacking, for a satisfactory reason, at the time the grades are reported. The instructor who gives an *I* for a course specifies the date by which the student must have made up the deficiency. In no case may an extension be granted beyond one calendar year from the date the course ended. If the course is not completed, a statement of *No Credit* is made upon the student's record.

COURSES PRIMARILY FOR UNDERGRADUATES. Students granted provisional admission may on occasion be required as part of their program to take undergraduate courses as prerequisites to continued graduate study. Undergraduate courses thus taken and others elected by the student will carry no graduate credit.

In exceptional cases, 100-level courses *outside the major department* may be taken for graduate credit to a maximum of two one-semester courses or one year-course not exceeding a total of 8 units, when approved by the Director of the Graduate Program in the major department and in the department in which the course is listed.

NORMAL PROGRAMS. Normally graduate students who do not carry teaching or assisting duties carry a full load of graduate work until the requirements of the degree are met.

WITHDRAWAL AND INTERRUPTION OF PROGRAM. *From a course.* After 14 days from the date of registration students may drop courses only with the approval of the Director of the Graduate Program, the instructor of the course to be dropped, and the Dean of the School of Nursing. If the course is dropped without the necessary approval, the permanent record will list the course as *Dropped Unofficially, F.* If a course is dropped 30 days or more after the beginning of the class for the semester involved, the status of the student at the time of withdrawal from the course will be determined and be indicated by the designation *Withdrew Passing* (W.P.) or *Withdrew Failing* (W.F).

From the School. The University reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory

to the University, even though no specific charge be made against the student. If a student wishes for any reason to withdraw from the School she should notify both the Director of the Graduate Program and the Dean of the School prior to the date of her expected withdrawal.

Students who find it necessary to interrupt their program of study for a period longer than a summer vacation should, before departure, provide in writing a statement of the reason for interruption, mailing address, and expected date of return.

TRANSCRIPT. A student who wishes to transfer his credits from Duke University to another institution is entitled to one free transcript of his record. A fee of one dollar, payable in advance, is charged for each additional copy. Requests are directed to the Records Office.

Financial Regulations

GENERAL FEES IN THE ACADEMIC YEAR. The following tables show the general fees and changes collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration for that semester. No student is admitted to classes until arrangements have been made with the Treasurer of the University for the settlement of fees.

Tuition per semester	$525.00
General fee* per semester	93.50
Summer Session .....per unit	35.00

* General fees, in lieu of most special charges, include the following fees: Mathematics, Athletic, Medical, Library, Damage, Commencement, Diploma, and an average of the Laboratory and Materials fees. Expenses for field trips are not included.

Tuition and fees for a full semester program of 16 units amount to $618.50. For a part program in the regular semesters, tuition and fees are computed at the rate of $35.00 per unit plus $5.00 fee for each course. Tuition and fees for course work in the Summer Session are computed at the rate of $35.00 per unit. Federal traineeships are available for a selected number of qualified applicants.

WITHDRAWAL FROM A COURSE OR FROM THE GRADUATE PROGRAM. Arrangements made with the Treasurer to prorate tuition and fees due do not imply that the full amount is not due and payable. A student who after 14 days after the date of registration withdraws from a course or from the Graduate School is liable for payment of full tuition fees and room rent.

LIVING ACCOMMODATIONS. Graduate students in the School of Nursing may occupy rooms in the School of Nursing residence. The rental charge for a single room is $465.00 for the 12 month period. The rental charge for a double room is $395 for each occupant. Rooms

are rented for a period of not less than one semester unless special arrangements are made through the Housing Bureau after official acceptance for admission to the University. Students may arrange for apartments or rooms in private homes in the city. The Housing Bureau of the University maintains a file of rooms and apartments listed with it for rental. Students may use this file as an aid to locating suitable living accommodations.

DINING SERVICE. Food service on both the Woman's College Campus and the West Campus is cafeteria style. The cost of meals approximates $1.75 to $2.25 per day, depending upon the need and taste of the individual. The dining facilities on the West Campus include three cafeterias with multiple-choice menus, a grill, and, in addition, the Oak Room where full meals and a la carte items are served. The Men's Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 P.M. The prices are the same as in the West Campus Union. Because of the large number of those served in the dining halls, it is not possible to arrange special diets for individual students.

MEDICAL CARE. The complete medical facilities of the Duke University Medical Center are available to all members of the University community. To secure the benefits of the Student Health program, a graduate student during the term or semester in which the illness occurs must 1) in the Summer Session term be registered for at least 3 units, 2) prior to completing minimum residence requirements be registered for at least 9 units per semester. Students are not covered during vacations and their dependents and members of their family are not covered at any time. Care is provided at the Health Office in Hanes House.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions, and elective surgery.

Graduate students are urged to carry adequate health insurance to supplement Student Health Program services. If students have insurance providing hospitalization, surgical, or medical benefits, the benefit shall be applied to the cost of their medical care.

MOTOR VEHICLES. Every motor vehicle operated on the campus by students enrolled in Duke University must be registered at 07 Allen Building within five days after arrival and thereafter must display the proper decal emblem. To register a vehicle, the student should present the following documents: (1) state vehicle registration,

(2) state operator's license, (3) evidence of automobile liability insurance as required by North Carolina law ($5,000 per person, $10,000 per accident for personal injuries; $5,000 for property damage).

STUDENT ACTIVITIES. Graduate students new to Duke University may be reminded that they are welcome to use such recreation facilities as swimming pools, tennis courts, golf course, and to affiliate with choral, drama, and religious groups. They may become junior members of the American Association of University Professors.

UNIVERSITY COUNSELING CENTER. The University maintains a Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. In addition, the Center administers special group testing programs for University schools and departments and serves as the local testing center for a wide variety of national testing programs. The Center also carries on programs of research in the field of measurement and counseling.

Master of Science in Nursing

Philosophy and Purpose of Graduate Education

AT Duke University, Graduate Study in Nursing operates within the organizational structure of the School of Nursing and derives its rights and responsibilities from the statutes of Duke University. It conducts its educational programs in accordance with policies which regulate the edcuational status of graduate students within this University. While the School of Nursing regulates its own educational affairs, the graduate faculty in nursing maintains a cooperative relationship with other faculties within the University and utilizes the educational resources of other graduate programs that are appropriate to its purposes.

Fundamental to Graduate Study in Nursing is the philosophy of Duke University as epitomized by its motto (*Eruditio et Religio*), which "reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation and the church. Through changing generations of students, the objective has been to encourage each individual to achieve to the extent of his capacities an understanding and appreciation of the world in which he lives, his relationship to it, his opportunities and his responsibilities."

Graduate Study in Nursing takes its direction from the belief that nursing is a social institution designed to serve man in relation to his health status as determined by his preventive, therapeutic, and rehabilitative health needs. It draws from philosophy and from the natural and social sciences knowledges applicable to its own professional problems.

Graduate Study in Nursing contributes to the advancement of the profession of nursing by the development of understandings and abilities essential to leadership roles in nursing and their correlation with those of other health disciplines, to an extension of nursing knowledge and its application to current and emerging health needs of society, and to effective group functioning.

The ultimate aim of Graduate Study in Nursing is the improvement of nursing practice and of nursing education. To this end, Graduate Study in Nursing furthers individual professional de-

velopment and fosters the use of thought processes such as analysis, synthesis, and evaluation essential to the solution of problems associated with the provision of nursing services and the education and supervision of nursing personnel. It provides organized programs of study designed to realize its aim.

At Duke University, Graduate Study in Nursing has as its purpose the provision of learning opportunities for graduates of accredited baccalaureate programs in nursing to develop: advanced nursing competency in patient care; ability to communicate these learnings through the process of teaching and supervising in nursing; ability to critically consume, utilize, promote and participate in research in nursing and allied health fields; and ability to assume and use leadership roles and resources for the advancement of the Profession of Nursing and for continued professional growth.

REQUIREMENTS FOR THE MASTER OF SCIENCE IN NURSING

1. Satisfaction of subject matter deficits in undergraduate study that have resulted in provisional admission to graduate study, such as psychiatric and public health nursing and educational psychology or their equivalents.
2. Matriculation for the degree Master of Science in Nursing upon satisfactory completion of the initial 12 units of graduate work and the approval of the Director of Graduate Studies.
3. Satisfactory completion of the program of studies.
4. Passed comprehensive examination.

RESIDENCE REQUIREMENTS. Candidates for Master's degree must spend, as a minimum, one calendar year at Duke University. Often more time will prove necessary depending upon the nature of the student's program of studies.

TRANSFER OF GRADUATE CREDITS. Under certain circumstances a maximum credit of 6 units may be allowed for graduate courses completed elsewhere. The acceptance of credit up to this amount, however, will not reduce the minimum period of full-time registered residence at Duke University.

TIME LIMITS FOR COMPLETION OF MASTER'S DEGREES. The candidate for the Master's degree who is in residence for consecutive academic years should complete all requirements for the degree within two calendar years from the date of her first registration in the Graduate Program. Any candidate must complete all requirements within six calendar years of her first registration.

Credits earned over a longer period of time cannot be credited toward a degree.

In her graduate work the student must present satisfactory achieve-

ment for a minimum of 38 units of graduate credit. Nine of these units are earned outside of the major (Nursing) and are selected with the approval of the major professor from the course offerings in the natural and social sciences which correlate with her program of study in Nursing.

GRADUATE STUDY IN NURSING

Emphasis is placed throughout graduate study in nursing on critical thinking and on the ability to analyze and evaluate situations, to identify problems, to synthesize knowledges for arriving at conclusions, solutions, or improvements, to teach and guide others, and to function within an organized social group such as a faculty or service agency.

The interrelatedness of principles and processes involved in nursing care and in the teaching and supervising of nursing is stressed. Problems affecting either or both are the content of nursing seminar.

Nursing theory, research process, and functional subjects are presented in a correlated manner and concurrently with directed experience in patient care and in the teaching or supervising of nursing care.

The curriculum also includes courses that enable the student to deepen understanding of the scope of nursing and of nursing education; the major problems confronting the profession; the changing social scene and related health organization and leadership roles in nursing; and the relatedness of nursing to other disciplines concerned with human welfare.

Theory concerned with human interacting and with the psychophysiological aspects of health and illness is offered. Provision is made for both intra and interdisciplinary communication and collaboration. Students are assisted toward a conscious and purposeful use of the professional self.

Research orientation is accomplished through theory in research process and methodology, nursing research seminar, and the inclusion of related researches in other course content. Students are required to define a research problem in nursing and to develop the research design. The completed dissertation is not a requirement for the Master of Science in Nursing. Research guidance is provided for the realization of the research requirement and is extended for the student who elects to complete the dissertation.

The general curriculum design for graduate study includes the following courses required of all graduate students of nursing:

Research in Nursing ..... (2 units)
Seminar in Nursing Research ..... (3 units)

Principles and Processes of Teaching and Supervising in Nursing ..... (2 units)
Curriculum Development and Improvement in Nursing ..... (3 units)
Perspectives in Health Promotion and Patient Services ..... (3 units)
Human Behavior and Psychophysiology ..... (4 units)
Related Science ..... (9 units)

In addition, individual programs provide theory, practice and seminar for both the advancement of clinical nursing competency and the development of initial competency in teaching or supervising within the student's selected area of clinical specialization in nursing (12 units).

The program of study covers two semesters and the full summer session. Students are admitted in the Fall of each year.

Medical-Surgical Nursing Program

Fall Semester

*N231 Medical and Surgical Nursing	6 units
N235 Research in Nursing	2 units
N250 Human Behavior and Psychophysiology	2 units
N233 Principles and Processes of Teaching and Supervising in Nursing	2 units
Related Science	3 units
	15 units

Spring Semester

*N232 Medical and Surgical Nursing	6 units
N234 Curriculum Development and Improvement in Nursing	3 units
N251 Human Behavior and Psychophysiology	2 units
Related Science	3 units
	14 units

Summer Session

*N237 Perspectives in Health Promotion and Patient Services	3 units
N239 Seminar in Nursing Research	3 units
Related Science	3 units
	9 units

N231-232. MEDICAL AND SURGICAL NURSING (12 units).—Provides theory; directed experience in patient care and in the teaching and supervising of nursing; and nursing seminar. Studies and evaluates patient needs and related nursing process in light of natural, behavioral and health sciences. Stresses the continuum of care, rehabilitation philosophy and principles, and interdisciplinary collaboration for patient welfare. Seminar is directed at the identification, evaluation, and solution of problems affecting nursing and the teaching or supervising

* Includes: Theory (2); Directed Clinical Experience (3); and Nursing Seminar (1).
* Includes: Theory (2); Directed Teaching or Supervision in Nursing (3); and Nursing Seminar (1).
* Includes: Theory (2); and Selected Field Observations (1).

of nursing. Directed experience provides opportunity for: (1) advancing content, synthesizing knowledges and testing theories of nursing practice; and (2) the development of initial competencies in teaching or supervising in nursing.
(Fall and Spring Semesters) Miss Mattingly and Staff

N233. PRINCIPLES AND PROCESSES OF TEACHING AND SUPERVISING IN NURSING (2 units).—Considers the principles and processes of teaching and supervising and their application to nursing. Studies criteria for the selection and use of methods and materials in formal and informal learning-teaching situations in nursing. (Fall Semester) Miss Minniear

N234. CURRICULUM DEVELOPMENTS AND IMPROVEMENT IN NURSING (3 units).—Studies trends and factors influencing curriculum development in nursing, educational programs in nursing, essentials to curriculum improvement, and criteria for program evaluation. Miss Mattingly

(Spring Semester, Prerequisite N233)

N235. RESEARCH IN NURSING (2 units).—Studies research process and methodology through analytical and critical review of research in nursing and related fields, the definition of individual research problems in nursing, and the formulation of research designs. (Fall Semester) Miss Mattingly

N237. PERSPECTIVES IN HEALTH PROMOTION AND PATIENT SERVICES (3 units).—Examines leadership roles in nursing as related to the current and emerging social scene and programming at the local, national, and international levels. Offers selected field observation and conference experiences.
(Summer Session) Miss Minniear

N239. NURSING RESEARCH SEMINAR (3 units).—Provides opportunity for students to present and justify their individual research problems and to analyze previous learnings toward the identification of additional problem areas for nursing research. Miss Mattingly

N250-251. HUMAN BEHAVIOR AND PSYCHOPHYSIOLOGY (4 units).—Presents the current theory of psychophysiology with the aim to develop deepened appreciation of the personality-illness relationship and of the influence of psychological factors in the genesis of somatic reactions and of somatic disease.
Dr. Reckless

RELATED SCIENCE. Students elect nine units of credit from the course offerings in the natural or social sciences which correlate with their nursing subjects and can be taken concurrently with them.

BULLETIN
OF
DUKE UNIVERSITY

The School of Law

ANNOUNCEMENTS FOR 1965-66

VOLUME 37 April, 1965 NUMBER 6-A

Annual Bulletins

For Bulletin of Information for Prospective Students, apply to *The Registrar,* Duke University, Durham, N. C. 27706

For Bulletin of Undergraduate Instruction, apply to *The Registrar,* Duke University, Durham, N. C. 27706

For Bulletin of Engineering, apply to *The Registrar,* Duke University, Durham, N. C. 27706

For Bulletin of The Divinity School, apply to *The Dean of the Divinity School,* Duke University, Durham, N. C. 27706

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For Bulletin of The School of Law, apply to *The Dean of the School of Law,* Duke University, Durham, N. C. 27706

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For Bulletin of The Summer Session, apply to *The Director of the Summer Session,* Duke University, Durham, N. C. 27706

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BULLETIN
OF
DUKE UNIVERSITY

THE SCHOOL OF LAW

ANNOUNCEMENTS FOR 1965-66

DURHAM, NORTH CAROLINA
1965

"I have selected Duke University as one of the principal objects of this trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical, lines, is, next to religion, the greatest civilizing influence. I request that this institution secure for its officers, trustees and faculty men of such outstanding character, ability and vision as will insure its attaining and maintaining a place of real leadership in the educational world, and that great care and discrimination be exercised in admitting as students only those whose previous record shows a character, determination and application evincing a wholesome and real ambition for life. *And I advise that the courses at this institution be arranged, first with special reference to the training of preachers, teachers, lawyers and physicians, because these are most in the public eye, and by precept and example can do most to uplift mankind, . . .*"

(From the Indenture of James B. Duke)

Contents

PAGE

Calendar 5

Officers of Administration 6

Faculty 7

The School: Its Purposes and Methods 10

Directions and Requirements for Admission 11

Expenses, Fees and Financial Aids 14

Living Accommodations 15

Bachelor of Laws Degree 18

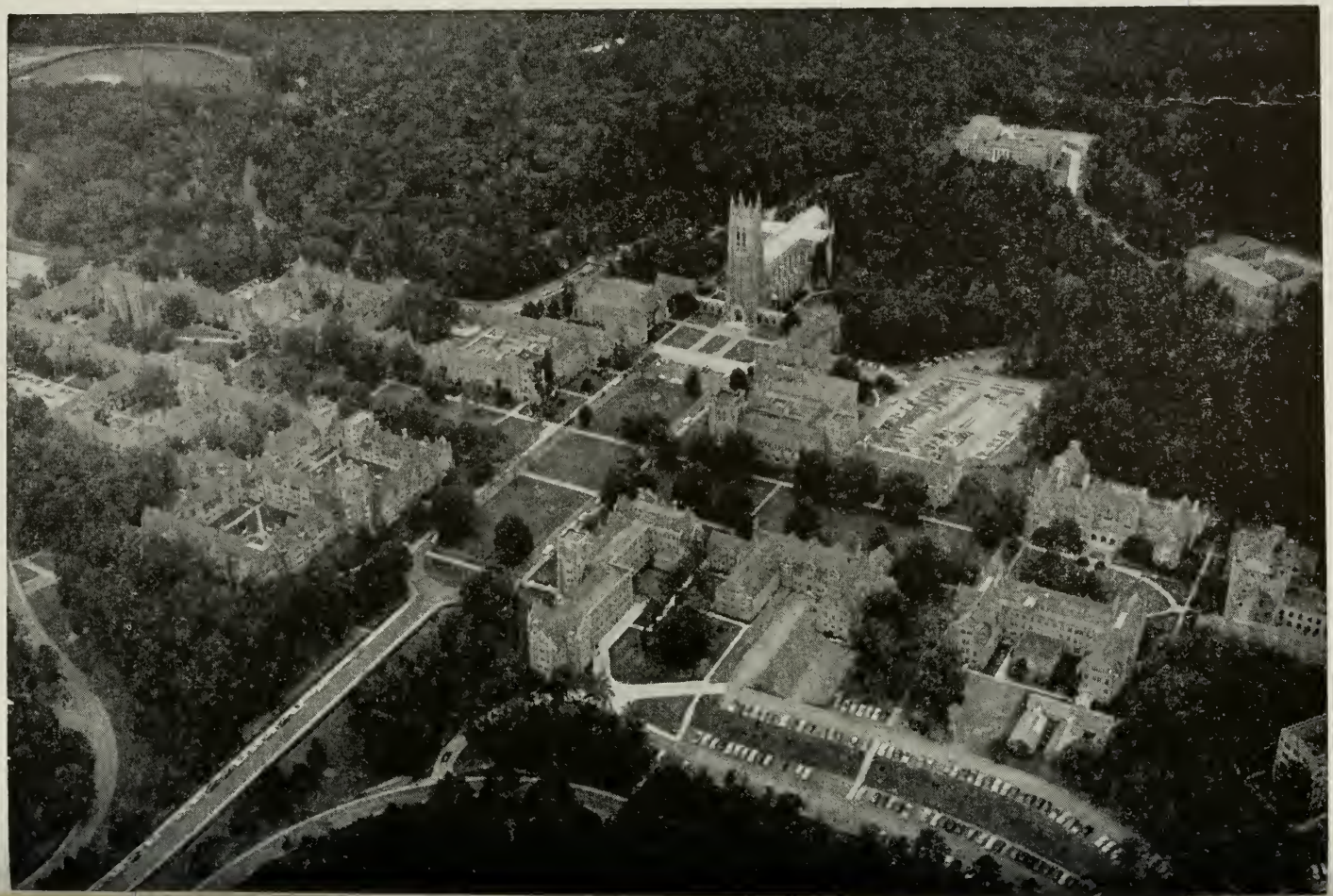
Graduate Work in Law 20

Facilities and Activities 24

Program of Instruction 29

Description of Courses 31

Students 38



THE MAIN UNIT OF THE UNIVERSITY WITH CHAPEL

Calendar 1965-1966

1965

Sept. 13—Monday, Registration day for first-year students.

Sept. 14, 15—Tuesday and Wednesday, Registration day for second- and third-year students.

Sept. 16—Thursday, Classes begin, 8 A.M.

Nov. 24—Wednesday, Thanksgiving holidays begin, 1 P.M.

Nov. 29—Monday, Classes resumed, 8 A.M.

Dec. 18—Saturday, Christmas recess begins, 1 P.M.

1966

Jan. 3—Monday, Classes resumed, 8 A.M.

Jan. 15—Saturday, Fall semester classes end, 1 P.M.

Jan. 17—Monday, Mid-year examinations begin.

Jan. 28—Friday, Mid-year examinations end.

Jan. 10, 11—Monday and Tuesday, Registration for Spring Semester.

Jan. 31—Monday, Spring semester classes begin, 8 A.M.

March 26—Saturday, Spring vacation begins, 1 P.M.

April 4—Monday, Classes resumed, 8 A.M.

May 18—Wednesday, Spring semester classes end, 1 P.M.

May 19—Thursday, Final examinations begin.

June 1—Wednesday, Final examinations end.

June 4—Saturday, Commencement begins.

June 6—Monday, Graduating exercises.

Officers of the University Administration

Douglas Maitland Knight, Ph.D., LL.D., Litt.D.
President of the University

Robert Taylor Cole, Ph.D.
Provost

Gerhard Chester Henricksen, M.A., C.P.A.
Vice President for Business and Finance
Treasurer

Everett Harold Hopkins, LL.D.
Vice President for Planning and
Institutional Studies and Assistant Provost

Frank Leon Ashmore, A.B.
Vice President for Institutional Advancement
Assistant Provost

Charles Edward Jordan, A.B., LL.D.
Vice President for University Relations

Frank Traver de Vyver, Ph.D.
Vice Provost

Harold Walter Lewis, Ph.D.
Dean of Arts and Sciences and Vice Provost

Barnes Woodhall, M.D.
Vice Provost

Benjamin Edward Powell, Ph.D.
Librarian

Richard Lovejoy Tuthill, Ed.D.
University Registrar

Craufurd D. W. Goodwin, Ph.D.
Secretary

Edwin Constant Bryson, LL.B.
University Counsel

Faculty

Hans W. Baade, A.B., LL.B., LL.M., Dr.iur., Diplomé de Droit International, *Professor of Law; Editor,* Law and Contemporary Problems; *American Editor,* Journal of Business Law.

A.B. 1949, Syracuse University; Dr.iur. 1951, University of Kiel, Germany; LL.B., LL.M. 1955, Duke University; Diplomé 1956, Hague Academy of Internatioual Law. Assistent, 1955, and Referent, 1956-1960, Institute of International Law, University of Kiel, Germany, Associate Professor of Law, Duke University, 1960-63; Professor of Law, since 1964.

W. Bryan Bolich A.B., B.A. (Juris.), M.A., B.C.L., *Professor of Law.*

A.B. 1917, Duke University; Duke University Law School, 1919-1921; B.A. (Juris.), 1923, B.C.L. 1924, M.A. 1928, Oxford University. General practice, 1924-1927; Member North Carolina House of Representatives, 1927; Legal Attaché American Embassy, Rome, 1950; Visiting Professor of Law, University of North Carolina, Summer 1951, 1955; University of Houston, Spring Semester 1957. Professor of Law, Duke University, since 1927.

John S. Bradway, A.B., A.M., LL.B., LL.D., *Professor of Law Emeritus.*

A.B. 1911, A.M. 1915, LL.D. 1957, Haverford College; LL.B. 1914, University of Pennsylvania. General practice, 1914-1929; Legal Aid Society of Philadelphia, 1914-1920; Chief Counsel, Philadelphia Legal Aid Bureau, 1920-1922; Secretary, National Association of Legal Aid Organizations, 1923-1940; President, 1940-1942; Visiting Professor of Law and Director of the Legal Aid Clinic, University of Southern California, Summer 1928; Professor of Law and Director of the Legal Aid Clinic, University of Southern California, 1929-1931; Vice-president, N.C. Bar Association, 1945-1946; Visiting Professor, University of North Carolina School of Social Work, 1949-1959. Professor of Law and Director of the Legal Aid Clinic, Duke University, 1931-1959; Professor of Law Emeritus, since 1959.

Edwin C. Bryson, LL.B., *Professor of Law.*

University of North Carolina, 1922-1925; Duke University, 1932-1933; LL.B. 1937, University of Oregon. General practice, 1927-1930. Assistant in Duke University Legal Aid Clinic, 1931-1947; Duke University Counsel since 1945; Associate Professor of Law 1947-1954; Professor of Law, since 1954.

Brainerd Currie, A.B., LL.B., LL.M., J.S.D., *William R. Perkins Professor of Law.*

A.B. 1937, LL.B. 1935, Mercer University; LL.M. 1941, J.S.D. 1955, Columbia University. Instructor in Law, Mercer University, 1935-1937; Assistant Professor of Law, Wake Forest College, 1937-1941; Associate Professor of Law, University of Georgia, 1941-1942; Professor of Law, Duke University, 1946-1949; Professor of Law, University of California, Los Angeles, 1949-1952; Dean and Professor of Law, University of Pittsburgh, 1952-1953; Professor of Law, University of Chicago, 1953-1961. Professor of Law, Duke University, since 1961.

Robinson Oscar Everett, A.B., LL.B., *Adjunct Professor of Law; Co-Editor,* Law and Contemporary Problems.

A.B. 1947, LL.B. 1950, Harvard University. Assistant Professor of Law, Duke University, 1950-1951; Military Service, Legal Officer in Air Force, 1951-1953; Commissioner of the U.S. Court of Appeals, 1953-1955; general practice, since 1955. Visiting Associate Professor of Law, Duke University, since 1956; Adjunct Professor of Law, since 1961.

Paul Hardin, III, A.B., LL.B., *Professor of Law; Faculty Advisor,* Duke Law Journal.

A.B. 1952, LL.B. 1954, Duke University. General practice, 1954; Military Service, United States Army Intelligence, 1954-1956; general practice, 1956-1958; Visiting Professor of Law, University of Texas, Summer 1960. Assistant Professor of Law, Duke University, 1958-1961; Associate Professor of Law, 1962-1963; Professor of Law, since 1963.

Clark C. Havighurst, A.B., J.D., *Associate Professor of Law; Associate Editor,* Law and Contemporary Problems.

A.B. 1955, Princeton University; J.D. 1958, Northwestern University. Military Service, 1958-60; Research Associate, Small Business Studies. Duke University, 1960-61; Private Practice, 1961-64; Associate Professor of Law, Duke University, since 1964.

John D. Johnston, Jr., A.B., LL.B., *Associate Professor of Law and Assistant Dean; Editor,* Journal of Legal Education.

A.B. 1954, LL.B. 1956, Duke University. Private business, 1956-58; general practice, 1959-62. Assistant Dean and Assistant Professor of Law, Duke University School of Law, 1962-1964; Associate Professor of Law, 1965.

Arthur Larson, A.B., M.A., B.C.L., D.C.L., LL.D., *Professor of Law and Director of Rule of Law Research Center.*

A.B. 1931, LL.D. 1953, Augustana College; M.A. (Juris.) 1938; B.C.L. 1957, D.C.L. 1957, Oxford University; Fellow of Pembroke College, Oxford. General Practice, 1935-1939; Assistant Professor of Law, University of Tennessee, 1939-1941; Division Counsel, Office of Price Administration, 1941-1944; Chief, Scandinavian Branch Foreign Economic Administration, 1944-1945; Associate Professor, Cornell Law School, 1945-1948; Professor of Law, Cornell Law School, 1948-1953; Fulbright Fellowship, London School of Economics, 1952; Dean, University of Pittsburgh Law School, 1953-1954; Under Secretary of Labor, 1954-1956; Director, U.S. Information Agency, 1956-1957; Special Assistant to the President 1957-1958; Special Consultant to the President on Rule of Law. Professor of Law and Director of Rule of Law Research Center, Duke University, since 1958.

Elvin R. Latty, B.S., J.D., J.Sc.D., *Dean and Professor of Law.*

B.S. 1923, Bowdoin College; J.D. 1930, University of Michigan; J.Sc.D. 1936, Columbia University. Instructor in Romance Languages, University of Vermont, 1923-1927; general practice, 1930-1933; Special Fellow, Columbia University, 1933-1934; Associate Professor of Law, University of Kansas, 1934-1935; Professor of Law, University of Missouri, 1935-1937; Visiting Professor of Law, George Washington University, Summer 1937; Stanford University, Summer 1938; University of North Carolina, Summer 1942, 1947, 1949, 1956; University of Texas, Summer 1951; Fulbright lecturer, University of Pavia, Italy, 1954; Special Assistant to the American Ambassador, Caracas, 1942-1943; Acting Assistant Chief, Foreign Funds Control Division, U.S. Department of State, 1943. Professor of Law, Duke University, since 1937, and Dean of School of Law, since 1958.

Charles H. Livengood, Jr., A.B., LL.B., *Professor of Law.*

A.B. 1931, Duke University; LL.B. 1934, Harvard University. General Practice, 1934-1940; Regional Attorney for the Seventh Region, Wage and Hour Division, U.S. Department of Labor, 1940-1941; Chief of the Wage-Hour Section, Office of the Solicitor of Labor, 1941-1942; Lieutenant Commander, USNR, on active duty, 1942-1945; general practice, 1945-1948; Visiting Professor of Law, University of North Carolina, Summer 1948; George Washington University, Summer 1949, 1956; Fulbright Lecturer, University of Sydney, Australia, 1958-1959. Lecturer in Law, Duke University, 1946-1948; Associate Professor of Law, 1948-1951; Associate Editor, *Journal of Legal Education*, 1951-1952; University Marshal, since 1953; Professor of Law, since 1951.

Charles L. B. Lowndes, A.B., LL.B., S.J.D., *James B. Duke Professor of Law.*

A.B. 1923, Georgetown University; LL.B. 1926, S.J.D. 1931, Harvard University. General practice, 1926-1927; Assistant Professor of Law, Georgetown University, 1927-1928; Professor of Law, Georgetown University, 1928-1930; Research Fellow, Harvard Law School 1930-1931; Professor of Law, Georgetown University, 1931-1934. Professor of Law, Duke University, since 1934.

Malcolm McDermott, A.B., LL.B., *Professor of Law Emeritus.*

A.B. 1910, Princeton University; LL.B. 1913, Harvard University. General practice, 1913-1930; Dean and Professor of Law, University of Tennessee, 1920-1930; Visiting Professor of Law, University of Southern California, Summer, 1929; Legal Consultant, Department of Defense, 1951. Professor of Law, Duke University, 1930-1954; Professor of Law Emeritus, since 1954.

Forest Hodge O'Neal, A.B., LL.B., J.S.D., S.J.D., *Professor of Law.*

A.B. 1938, LL.B. 1940, Louisiana State University; J.S.D., 1949, Yale University; S.J.D. 1954, Harvard University. Associate Professor of Law, University of Mississippi 1945-1946; Professor of Law, University of Mississippi, 1946-1947; Acting Dean and Professor of Law, Walter F. George School of Law, Mercer University, 1947-1948; Dean, Walter F. George School of Law, Mercer University, 1948-1956; Professor of Law, Vanderbilt University, 1956-1959; Visiting Professor of Law, New York University, 1957-1958. Professor of Law, Duke University, since 1959.

Joel Francis Paschal, A.B., LL.B., A.M., Ph.D., *Professor of Law.*

A.B. 1935, LL.B. 1938, Wake Forest College; A.M. 1942, Ph.D. 1948, Princeton University. Instructor in Law, Wake Forest College, 1939-1940; USNR, 1942-1946; Instructor, Princeton University, 1946-1947; Research Director, North Carolina Commission for the Improvement of the Administration of Justice, 1947-1949; general practice, 1949-1954; Visiting Professor of Law, Duke University, 1952-1953; Visiting Professor, University of North Carolina, Spring Semester 1956. Associate Professor of Law, Duke University, 1954-1959; Professor of Law, since 1959.

Melvin G. Shimm, A.B., LL.B., *Professor of Law; Faculty Advisor,* Duke Law Journal.

A.B. 1947, Columbia University; LL.B. 1950, Yale University. 2nd Lt. FA (AUS), 1943-1946; general practice, 1950-1951; Counsel, Wage Stabilization Board, 1951-1952; Bigelow Fellow, University of Chicago Law School, 1951-1953; Visiting Associate Professor of Law, New York University, Summer 1957. Assistant Professor of Law, Duke University, 1953-1956; Associate Professor of Law, 1956-1959; Professor of Law, since 1959.

Dale F. Stansbury, B.S., LL.B., J.S.D., *Professor of Law Emeritus.*

B.S. 1914, Valparaiso University; LL.B. 1917, Indiana University; J.S.D. 1929, Yale University. Sterling Research Fellow, Yale University, 1928-1929; Deputy Attorney Gen-

eral of Indiana, 1918-1924, 1928; general practice, 1925-1927; Professor of Law, Mercer University, 1929-1935; Dean and Professor of Law, Wake Forest College, 1935-1944; Professor of Law, University of Tennessee, 1944-1946. Professor of Law, Duke University, 1946-1961; Professor of Law Emeritus, since 1961.

William W. Van Alstyne, B.A., LL.B., *Professor of Law.*

B.A. 1955, University of Southern California; LL.B. 1958, Stanford University; California Department of Justice, 1958; United States Department of Justice, 1958-59; Assistant Professor, Ohio State University College of Law, 1959-61; Associate Professor, 1961-1964. Visiting Associate Professor of Law at Duke University, spring semester 1964; Professor of Law, 1965.

Lawrence G. Wallace, A.B., M.P.A., LL.B., *Associate Professor of Law.*

A.B. 1952, M.P.A. 1954, Syracuse University; LL.B. 1959, Columbia University. U.S. Air Force, 1953-1955; Staff, Maxwell Graduate School, Syracuse University, 1956; general practice, 1959-1960; Law Clerk to Associate Justice Hugo L. Black, U.S. Supreme Court, 1960-1961. Assistant Professor of Law, Duke University, 1961-1963; Associate Professor of Law since 1964.

Robert Renbert Wilson, A.B., A.M., Ph.D., LL.D., *Professor of Political Science and International Law.*

A.B. 1918, Austin College; A.M. 1922, Princeton University; Ph.D. 1927, Harvard University; LL.D. 1940, Austin College. Carnegie Fellow in International Law, 1922-1923, 1924-1925; Member, Advisory Committee, Harvard Research in International Law, 1935—; Member, Board of Editors, *American Journal of International Law*, 1937—; President, American Society of International Law, 1957-1958; United States Department of State: Assistant in Treaty Division, 1931-1932; Advisor on Commercial Treaties, 1944-1946; Consultant on Commercial Treaties, at various times, 1946-1953; Fulbright Professor Law School of Istanbul University, 1951-1952. Assistant Professor of Political Science, Duke University, 1925-1927; Associate Professor, 1927-1929; Professor, since 1929; Chairman, Department of Political Science, 1934-1948; Director, Graduate Studies in Political Science, 1937-1947, and since 1949; Professor of International Law, since 1948.

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Luke T. Lee, B.A., M.A., Ph.D., LL.B.

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Mary Louise Lewis, *Editorial and Research Assistant*
Jean T. Muse, *Administrative Assistant*

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Linda C. Brinkley, *Administrative Assistant*
Irene R. Byrd, *Registrar*

The School: Its Purpose and Methods

THE OFFICIAL NAME of the School is the Duke University School of Law, but it will be referred to in these pages as the Duke Law School or the Law School.

The Duke Law School stems historically from the School of Law of Trinity College, with its history of legal instruction running back to the middle of the past century, antedating the Civil War. When, in the 1920's, Trinity College became Duke University, the Law School was completely reorganized. This reorganization culminated with the housing of the Law School on the new West Campus in 1930, when the character of the Duke Law School can be said to have been reshaped.

The curriculum of the Law School provides thorough preparation for the practice of law in any state, and its graduates have been admitted to the bar throughout the nation. Opportunities for specialization in particular branches of the law are afforded.

In carrying out the trust imposed by the indenture establishing the Duke Endowment, the Law School seeks to have the student acquire knowledge and comprehension not only of legal doctrine, but also of the judicial process and of the social, economic, and political problems with which law and lawyers must deal. The method of instruction employed compels analysis of judicial opinions and inquiry into the nonlegal as well as the legal considerations which underlie them. In appropriate courses, special consideration is given to the work of the legislative and administrative agencies of government. In recognition of the increasing importance of the role of the lawyer in representing private interests before government agencies and in government service, a broad program is offered in the public law field. Scope for creative student work is provided by seminar courses and supervised individual study and research.

Practical training is not left for the first years of practice. A carefully integrated series of courses is designed to give students actual experience in the work of lawyers. Legal research, writing courses, moot court work and practical study of steps in law suits in the first and second years are followed in the third year by seminar courses emphasizing trial techniques, legal planning and drafting and interdisciplinary approaches. A student bar association affords a means whereby the student may gain acquaintance with the professional organizations through which a lawyer may and should contribute to the well-being of his profession and society.

Admission, Registration, and Fees

Admission

DIRECTIONS TO APPLICANTS FOR ADMISSION

APPLICATION must be made on the prescribed Law School application blank which will be sent upon request. A fee of $10.00 is charged for filing an application. No applicant will be accepted until all required documents are on file. These documents are: (1) the application itself, to which a recently made personal photograph must be attached; (2) a transcript of college record (see next paragraph); (3) a report of the applicant's score on the Law School Admission Test, described below; (4) letters from an official of the college attended and from three or more responsible persons who are acquainted with the applicant's character and general qualifications. *These letters will be requested by the Law School,* and the applicant need only furnish the names and addresses of persons from whom the desired information can be obtained.

Most of our applicants apply at a time when they are still in college, either in the fall or winter of their current college year. We do not ordinarily wait for the completion of the current year's college work before admitting an applicant; normally we take acceptance action on the basis of a transcript showing college work through the junior year, although we may at times ask for a transcript showing also one semester or term of the senior year. Such acceptance is tentative only and is subject to our final action taken in the light of the further supplemental transcript showing all the college work required for admission to the Law School. (However, it is very rare for an accepted applicant to be later rejected on the basis of his completed transcript.) A good time for a student in college to apply, particularly if he has an outstanding record and wants to make his law school plans early, is in the fall of his final year.

Admitted applicants are required to deposit the sum of $50.00 with the Office of the Bursar. This deposit is non-refundable, but will be credited to the account of the matriculated student.

The Law School Admission Test, referred to above, is administered by the Educational Testing Service. It is given four times a year at examination centers conveniently located throughout the United States. No special preparation for the test is suggested, since it is designed to measure aptitudes, abilities, and general background rather than knowledge of subject matter. The applicant's score on the test

will be considered along with other data in passing upon his admission to the Law School. Application forms and information concerning the test should be procured by writing directly to the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

TIMES OF ADMISSION

Beginning students may enter only at the opening of the fall semester in any year. Students who have completed the first year of law study at this or any other law school approved by the Association of American Law Schools may enter at the beginning of any semester.

REQUIREMENTS FOR ADMISSION

An application for admission to Duke Law School as a candidate for the degree of Bachelor of Laws may be submitted by any person who is a graduate of a college of approved standing. Applications may also be submitted by a candidate who has completed in a college of approved standing work equivalent in number of units to three-fourths of that required for graduation and whose college work is of outstanding superior quality and in its entirety shows an average grade far above that required for graduation, the requirement in each case being determined by the regulations of the college where the work was taken.

COMBINED COURSE

A number of colleges, upon application by their students, have permitted those who have completed three years of undergraduate work to enter the Duke Law School and upon the satisfactory completion of the first year of law school work to receive their Bachelor of Arts degree from such colleges. It is suggested that students desiring to enter Duke Law School under such a program make inquiry of their proper college authorities regarding this point if they meet the applicable requirements of the preceding paragraph.

A student from an undergraduate college of Duke University who has completed therein three years of study may apply to that college to enroll in a combined course wherein his first year of law study may be accepted toward the Bachelor of Arts degree. Upon the completion of four additional semesters of law study, he will receive the Bachelor of Laws degree.

Students considering entrance before obtaining the Bachelor's degree should consult the rules of the Board of Bar Examiners in the state where they plan to practice law, for regulations applicable to this program.

ADMISSION TO ADVANCED STANDING

Any person who has complied with the requirements for admission set forth in this announcement prior to the commencement of his law

study, who presents evidence of the satisfactory completion of at least one year of study at any law school which is a member of the Association of American Law Schools, and who is eligible for readmission to the law school from which he proposes to transfer, may be admitted to advanced standing, subject to such rules as would be applicable to students in this School having a comparable scholastic record. Provisional credit for courses so completed will be given, final credit being conditioned on the completion of at least one full year of law study in this School with an average at least five points above the passing grade. Adjustment of credit for work done in such other law schools may be made by the Dean or by vote of the Faculty.

CANDIDATES FOR GRADUATE DEGREES

Applications for admission to graduate study should be addressed to the Dean of the Law School and should include transcripts of records of legal and prelegal work. For the requirements for the graduate degrees, see pages 20-23.

Registration

All students are required to register on the dates prescribed in the Law School Calendar, at which time class schedules and course cards must be filled out and approved. A student's registration for any semester is not complete until he has settled all indebtedness with the Office of the Bursar. Students who register in any semester at a date later than that prescribed are required to pay to the Office of the Bursar a $5.00 penalty for late registration.

REGISTRATION FOR BAR EXAMINATION

Many states now require that a student, prior to or shortly after beginning of the study of law, register with the board of bar examiners of the state if he intends to practice therein. Each student should ascertain by writing to the secretary of the board of bar examiners of the state in which he plans to practice, or by other channels of information, whether that state makes this requirement.

CONDUCT OF STUDENTS

All students are admitted subject to the rules of the University and of the Law School, and continuance in the School is conditioned upon the observance of such rules.

The University expects of its students loyal and hearty co-operation in developing and maintaining high standards of conduct and scholarship. The University, therefore, reserves the right, and matriculation is a concession by the student of this right, to compel the withdrawal of any student whose conduct at any time is not satisfactory to the University.

Fees and Expenses

Tuition is due and payable not later than the day of registration for a particular semester. For the academic year 1965-1966, the tuition is $600.00 a semester. After the final day of registration no refund of the tuition will be made except for involuntary withdrawal to enter the armed forces.

Law students may secure admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of the athletic fee of $15.00 per year plus any taxes that may be imposed. (This fee is payable in the fall semester.) They also may use the facilities of the Duke Golf Course upon payment of student green fees.

It is estimated that the expenses of a thrifty unmarried student at Duke Law School, aside from tuition, can be kept around $1,250.00 per academic year.

Additional fees and expenses are discussed under the headings Living Accommodations, Dining Service, and Motor Vehicles.

Scholarships, Loans, and Employment

Scholarships are available, varying in amount. Except for a few scholarships that are based purely on merit, scholarships are awarded only to needy applicants with markedly superior college records and comparable Law School Admission Test scores. A scholarship may cover all or part of the tuition charge. The more usual form of financial aid is a combination of scholarship and loan. Scholarship grants will be continued to second- and third-year students maintaining a high standard of work.

To the extent of the funds allocated to Duke University from its participation in the student loan program established under the national Defense Education Act of 1958, loans up to $2,000 per year (so limited as of the present writing) are available to Duke students. Interest on these loans begins to accrue at three per cent one year after the student leaves the School, and repayment normally begins two years after the student leaves the School, with complete repayment scheduled over a ten-year period.

Loans from funds held in trust by the University are also available to qualified law students. Interest on these loans, which mature after the student has left the School, accrues from the date of each note at the rate of one per cent until the student has left the School and for five years thereafter at three per cent per year, with repayment in installments over the five-year period. Loans from these funds are available up to $1,200 per year, less the amount of any loan made under the paragraph above.

Approval of loan application is based on the financial need, scholastic attainment, and personal integrity of the applicant. Unmarried students with automobiles, who plan to live on campus, must establish a bona fide need for the automobile before a loan application will be approved.

In addition to the loans above mentioned, the School participates in the American Bar Association Loan Fund and United Student Aid Fund programs. These programs provide guaranteed commercial bank loans (on usual bank terms) to needy law students, up to $1,000 per year. These loans are readily available.

A special fund is also available for law students for small loans to tide over temporary financial emergencies arising during the course of the year.

Although it is not advisable for a law student to undertake any substantial amount of outside work, arrangements have been made to provide part-time employment for capable law students who otherwise would be unable to meet the expense of studying law at Duke.

A number of positions as assistants in the Law Library and as research assistants are open to students, particularly in their second or third year, with some preference being given to those who do not receive other aids from the University.

Living Accommodations

The Men's Graduate Center is available to men enrolled in the Law School. The rooms are equipped for two persons and the rental charge for a double room is $500.00 for the academic year or $250.00 for each occupant ($125.00 per semester for each occupant).

Epworth Inn on the Woman's College Campus is available to women enrolled in the Law School. The rental charge for a single room is $325.00 for the academic year or $162.50 for each semester. The rental charge for a double room is $550.00 for the academic year or $275.00 for each occupant ($137.50 per semester for each occupant).

Duke University Apartments, which consists of efficiency, one-, and two-bedroom apartments, are available to married graduate students. The apartments are complete with basic furnishings and the current rental charges per month are $70.00 for the efficiency, $80.00 for the one-bedroom, and $90.00 for the two-bedroom. Heat, electricity except for window fans and air conditioners, hot and cold water, garbage and trash collection, and maintenance of grounds are all included in the rental charge. For further information on married student apartments, write to the Director of Housing, Duke Station, Durham, North Carolina.

Residence hall rooms and Duke University Apartments may be reserved by new applicants after they have been accepted officially

for admission to the School of Law. Applications for residence hall rooms are to be made to the Director of Housing, Duke Station, Durham, North Carolina. A $25.00 deposit is required of each applicant before a residence hall room reservation is made. The initial room deposit is effective during the student's residence in the University residence halls if attendance is continuous in regular academic years. The deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated provided written notice is received at the Housing Bureau requesting refund.

b. Upon withdrawal from Duke University Residence Halls by students enrolled on the semester basis, provided written notice is received by the Director of Housing by August 1st for cancellation of a reservation for the fall semester, and not later than January 15th for cancellation of a reservation for the spring semester.

c. When the reasons requiring withdrawal are beyond the student's control.

No refund will be made until the occupant has checked out of his room through the Housing Bureau and has settled his account with the Bursar.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of the reservation.

The authorities of the University do not assume responsibility for persons selected as roommates. Each student is urged to select his roommate when the room is reserved. Any student who occupies a double room without a roommate will be given written notice from the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room.

Any exchange of rooms must be made at the Housing Bureau. Persons exchanging rooms without the approval of the Housing Bureau will be subject to the charges for both rooms.

Rooms are rented for the academic year but for no period of less than one semester without special arrangements. After the day of registration, no refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule. Regulations governing the occupancy of rooms will be supplied by the Director of Housing to those students who make application for housing.

DINING SERVICE

Food service is cafeteria style. The cost of meals runs approximately $1.75 to $2.50 per day, depending on the need and taste of the individual. The dining facilities on the West Campus include

three cafeterias with multiple-choice menus, a grill, and the Oak Room where full meals and *a la carte* items are served.

In the Men's Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge where sodas and sandwiches are served from 11:30 A.M. to 11:00 P.M. The prices in these dining rooms are the same as on the West Campus.

MOTOR VEHICLES

Each motor vehicle operated on the campuses by students enrolled in the School of Law must be registered at the Traffic Office within 5 days after arrival, and thereafter must display the proper registration emblem. To register a vehicle, the student must pay the prescribed fee of $30 and present the following documents:

1. State vehicle registration.
2. State operator's license.
3. Evidence of automobile liability insurance as required by North Carolina law: $5,000 per person and $10,000 per accident for personal injuries, and $5,000 property damage.

Parking, Traffic, and Safety Regulations will be given each student registering his vehicle. Students are expected to abide by these regulations.

MEDICAL CARE

With exceptions noted below, full medical and surgical care is furnished to all regularly matriculated law students of the University who have paid the semester tuition. This service is under the direction of the Physician in charge with the co-operation of the Staff of Duke Hospital. It includes hospitalization (limited to thirty days), medical and surgical care, drugs, dressings, x-ray studies, and ward (but not special) nursing. A charge for board is made at the same rate as in the University dining halls. Refraction of eyes and treatment of teeth and of all chronic and pre-existing conditions, such as diseased tonsils, hernia, elective surgery, chronic skin conditions, endocrine disturbances, etc., or accidents or illnesses occurring during vacations or while off the campus are not included in this service. The cost of any necessary braces and orthopaedic appliances, as well as special nursing, must be borne by the patient. If the student has insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of his medical care.

Further information will be sent upon request. Address

The Dean of the School of Law

Duke University

Durham, North Carolina

Bachelor of Laws Degree

UPON favorable recommendation of the Faculty, the degree of Bachelor of Laws will be conferred on students who shall have successfully completed six semesters' study of law, the last two semesters of work immediately preceding the granting of such degree having been completed in this School.

A student shall be deemed to have completed successfully six semesters' study of law if during this period he has

(1) secured a passing grade in courses aggregating 84 semester hours;

(2) secured in every required course a grade not requiring repetition thereof; and

(3) secured a weighted average at least five points above passing, whether computed by including or by excluding the grades in the first-year courses.

Students who have spent only their last two semesters of study in residence in this School must have received a weighted average at least five points above passing for that year.

MINIMUM AND MAXIMUM STUDENT LOADS

No regular student is permitted to take less than twelve course hours per semester.

No first-year student is permitted to take courses in excess of the first-year program. Second- and third-year students are not permitted to take for credit more than sixteen course hours per semester, nor to audit and take for credit more than seventeen course hours per semester.

In exceptional cases, students may petition the Faculty for permission to take more or less than the prescribed maximum or minimum loads, but no student shall receive full residence credit if he takes fewer than ten hours per semester for credit.

ATTENDANCE

Regular class attendance is required. The right to take the examinations, as well as the privilege of continuing one's membership in the School at any time, is conditioned upon regular attendance at the exercises of the School.

STANDARDS OF SCHOLARSHIP

Eligibility to Continue Law Study.—Any student who at the end of his first year or at the end of any subsequent semester has an average grade lower than D on all the work then taken is ineligible to continue his work in the School. Any other student (1) whose average final grade at the end of his first semester is below D, or (2) whose average grade at the end of any subsequent semester on all the work then taken is below C, (3) who in any single semester or in any single year receives failure grades in courses totaling eight or more semester hours, may at any time be declared by the Dean ineligible to continue.

Notification of Unsatisfactory Scholastic Standing.—Every student subject to the provisions of the second sentence of the paragraph above, who has not been declared ineligible to continue his work in the School will be given a formal, written notice by the Dean's Office. This notice will set forth his average grade or grades and inform him (1) that he will be subject for the ensuing year to the special supervision of the Dean, who may order his dismissal from the School in the event of his failure to maintain a satisfactory scholastic standard, and (2) that he will be ineligible to receive a degree unless his work meets the scholastic requirements for graduation, which will be set forth in full in such notice.

Every other student whose average final grade at the end of any semester on the work of that semester, or on all work then taken, does not exceed the minimum average grade required for graduation by more than two points will be given a notice similar to that provided for above.

Graduate Work in Law

Objective of the Graduate Study Program

THE graduate program is framed with a view to the encouragement and recognition of legal scholarship. It is designed for the qualified candidate who aspires to a teaching career, or who wishes to become proficient in a special field of the law, to do legal research, to prepare himself for a public-law practice in or out of government, or to pursue studies in subjects he has not previously explored. This program is especially suitable for law teachers and for those who wish to become either law teachers or specialists in the law and who wish to carry on advanced study and original research under faculty supervision, and for foreign law students, teachers and lawyers who desire to extend their knowledge of the laws of the United States and to engage in comparative legal research.

Three graduate degrees are granted: the degree of Master of Laws (LL.M), the degree of Master of Comparative Law (M.C.L.), and the degree of Doctor of Juridical Science (S.J.D.).

Master of Laws

ADMISSION TO CANDIDACY FOR THE DEGREE OF MASTER OF LAWS

Any person who has received the first degree in law from a law school which is a member of the Association of American Law Schools, or from a university in the United Kingdom of Great Britain and Northern Ireland, or in Australia, Canada, Eire or New Zealand, may be admitted as a candidate for the degree of Master of Laws, provided he satisfies the Committee on Graduate Study that his objective in desiring to do graduate work in law is consistent with the purposes for which the program is offered, and provided he demonstrates to the Committee, on the basis of his record, his capacity to take and profit by graduate work in law. Normally the applicant will be required to show a level of scholarship appreciably higher than that required for the first degree in law at the institution from which he received that degree. Those applicants who aspire to a teaching career are expected to have had, and are expected to maintain throughout their graduate studies, an exceptionally high academic record.

REQUIREMENTS FOR THE DEGREE OF MASTER OF LAWS

The degree of Master of Laws is reserved for students who, having demonstrated their capacity for graduate work in law, maintain a level of scholarship substantially higher than that required for the degree of Bachelor of Laws.

The candidate for this degree is required to complete a course of study comprising not less than twenty nor more than twenty-six semester hours, or approved research equivalent thereto. Two full semesters are required for the completion of this program. A candidate for this degree is required to include in his course of study at least two courses or seminars selected from those offered in Jurisprudence, in Legal History, and in the International or Comparative Law area. Other suitable courses will be selected by the candidate subject to the approval of the Committee on Graduate Study. In special circumstances, credit of not more than two hours a semester may be given for approved special supervised-research projects. In addition to completing twenty semester hours of courses or seminars the candidate must prepare and submit an essay, representing substantial research on a legal subject. This essay is to be prepared under the supervision of the instructor in charge of the field in which the research is done. The candidate will find it helpful to have formulated a project of research, or alternative projects, before his admission to graduate study or, at any rate, before pursuing his graduate study in residence. In appropriate cases, the candidate will be permitted, and may be encouraged, to take related work in other departments of the University.

Master of Comparative Law

ADMISSION TO CANDIDACY FOR THE DEGREE OF MASTER OF COMPARATIVE LAW

Any person (1) who has received the degree of *doctor iuris* or its equivalent from a foreign university, or (2) who, having completed such academic training as is required in his country for the practice of law, has already demonstrated his special qualifications by publications in learned journals or otherwise, and who has the knowledge of and facility in the English language needed to achieve distinction in competitive study at an American university may be admitted as a candidate for the degree of Master of Comparative Law (M.C.L.). The applicant must satisfy the Committee on Graduate Study that his objective in doing graduate work in comparative law is consistent with the purposes for which the program is offered, and he must further demonstrate to the Committee, on the basis of a scholastic record comparable to at least a B average at an American law school of high standing, and by his previous publications, if any, his capacity to profit by graduate work in law. Normally, admission to candidacy for this

degree is limited to applicants who intend to study one or more specific fields of American law with a view to utilizing such knowledge upon their return to their respective countries, and who have already done some preparatory work in this direction.

Any person eligible to be admitted as a candidate for the degree of Master of Laws may, upon recommendation of the Committee on Graduate Study, be admitted to candidacy for the degree of Master of Comparative Law.

REQUIREMENTS FOR THE DEGREE OF MASTER OF COMPARATIVE LAW

The degree of Master of Comparative Law is awarded only to students who maintain a level of scholarship substantially higher than that required for the degree of Bachelor of Laws.

The candidate for this degree is required to complete a course of study comprising not less than twenty semester-hours. At least two semesters' residence are required for the completion of this program. A candidate for this degree is required to include in his course of study at least two courses from those offered in the World Law and Comparative Law area, and either Jurisprudence or Legal History. Other suitable courses will be selected by the candidate subject to the approval of the Committee on Graduate Study. In special circumstances, credit for not more than two hours a semester may be given for approved, supervised-research projects. The candidate is also required to submit an essay representing substantial research on a subject of comparative or international law, written in the English language. This essay is to be prepared under the supervision of the instructor in charge of the field in which the research is done. In appropriate cases, the candidate may be permitted and may be encouraged, to take related work in other departments of the University.

Doctor of Juridical Science

ADMISSION TO CANDIDACY FOR THE DEGREE OF DOCTOR OF JURIDICAL SCIENCE

A person holding the degree of Master of Laws or Master of Comparative Law (or Jurisprudence) from this or any other law school which is a member of the Association of American Law Schools may, on recommendation of the Committee on Graduate Study and favorable vote of the Faculty, be admitted to candidacy for the degree of Doctor of Juridical Science (S.J.D.), provided he completed the work for the Master's degree with distinction.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF JURIDICAL SCIENCE

Upon recommendation of the Faculty, the degree of Doctor of Juridical Science will be conferred on students admitted to candidacy for that degree who complete and submit a monograph or series of essays suitable for publication and deemed by the Faculty to be of distinguished character and who pass an oral examination before a special committee appointed for that examination. At least one academic year and, in the absence of an extension granted by the Faculty, not more than three years must elapse between the award of the Master's degree and the award of Doctor of Juridical Science. Students who have received the Master's degree from another law school must spend at least two full semesters engaged in research at this School, and in addition may be required to complete a course of study prescribed by the Committee on Graduate Study. The monograph or series of essays required may be based upon, or be an extension of, the essay required for the Master's degree, provided substantial additional research is represented.

Facilities and Activities

The Law School Building and Its Facilities

THE NEW Law School Building was completed and occupied in September, 1962. Located just off the Gothic core of the West (main) Campus, the building is of modified Georgian architecture with contemporary overtones. It reflects a notable characteristic of the School: a high ratio of facilities to students admitted. Despite long-range plans to keep the student body modest in size, the new Law Building in its general spaciousness, number of classrooms and seminar rooms, library reading-room seatings, library stack spaces, student carrels, student lockers, student lounge rooms, faculty offices, quarters for legal publications, special quarters for institutional studies and courtroom is of proportions ordinarily associated with a far larger student body.

Additional information concerning the Law School and its facilities is contained in the illustrated brochure *Studying Law at Duke.*

THE LAW LIBRARY

The Law Library is one of the large law school collections in the country. It consists of American and English statutory and case law; collections of international, comparative and foreign law materials; treatises, digests, encyclopedias; the various selected case series; a comprehensive collection of legal periodicals; and publications in the fields of history, economics, government, and other social sciences, supplemental to the strictly legal materials. The Library receives every current legal periodical of general interest printed in the English language and complete up-to-date legislation of the United States and of every state and territory of the Nation.

There are many thousands of additional volumes of a legal nature in the main University Library Building, as well as the general collection of over a million volumes, to all of which the law students and Faculty have convenient access.

The Law Library is administered by a professionally trained staff and is open to the public daily, as well as in the evenings when the Law School is in session.

RULE OF LAW RESEARCH CENTER

In the fall of 1958, the Duke Law School established its Rule of Law Research Center, with Professor Arthur Larson as its Director.

The purpose of the Center is to undertake both long-range and current studies and publications bearing on the settlement of international disputes and the achievement of peaceful change under law. Typical projects include "Sovereignty within the Law"; "Propaganda within the Law"; a definitive analysis of the World Court; and a series of studies of United Nations peace-keeping devices. A staff of about ten international lawyers is maintained, together with an undergraduate law student research assistant staff which generally numbers about twelve. The regular staff includes specialists in all the world's major legal systems. Opportunities for course work at the Law School include not only the regular courses in International Law, Comparative Law, and the Law of International Economic Relations, but a unique Seminar in World Law for students particularly interested in this approach to the problem of world order.

Duke University students are also encouraged to combine graduate work with activities of the Center, opportunities for which are made available as far as practicable.

Publications

LAW AND CONTEMPORARY PROBLEMS

The School of Law publishes a quarterly, *Law and Contemporary Problems,* edited by Professor Hans W. Baade. This periodical, now in its thirtieth volume, presents in each issue a symposium on a problem of current importance, in which the inter-related social and economic, as well as legal, factors are discussed by writers of competence in these respective fields.

The circulation of *Law and Contemporary Problems* extends not only to members of the legal profession and law libraries throughout the country, but also to industrial and financial concerns, governmental agencies, and public and general university libraries. Individual issues are not infrequently used as materials for study in University courses.

JOURNAL OF LEGAL EDUCATION

The *Journal of Legal Education,* a quarterly, is also edited at the School of Law, under the direction of Professor John D. Johnson, Jr. The publication serves as the organ for the Association of American Law Schools, providing a clearing house for ideas and professional studies in the constantly expanding field of legal education. The editorial policy of the *Journal of Legal Education* is determined by an editorial board named by the Association, assisted by an advisory committee consisting of prominent legal educators.

DUKE LAW JOURNAL

American legal education boasts at least one unique institution. Only in America, and only in law, are the scholarly professional journals edited and largely written by students. The *Duke Law Journal* carries forward this proud tradition, which dates from the latter part of the nineteenth century. Articles written by teachers, lawyers, judges and other scholars are critically evaluated and edited by the board of student editors. Notes and comments concerning recent judicial, legislative and other developments are written by the students themselves, and edited by their fellow students. Members of the Faculty are of course available for advice and consultation. The quarterly issues are widely circulated, and become an integral part of the store house of informal and critical materials to which the profession in all its branches must resort. The student-edited law journal has had a profound influence on the growth and development of the law.

Membership in the *Journal* is the highest honor that can be attained by the student, being reserved for those who not only excel in their courses but also demonstrate capacity to do creative research and writing. Moreover, in the well-nigh universal judgment of the profession, the experience gained in this work provides the best training that the Law School has to offer. It should be the aim of every qualified student to take advantage of this opportunity.

CORPORATE PRACTICE COMMENTATOR

The *Corporate Practice Commentator,* a quarterly periodical devoted to significant developments and new thinking in the field of corporation law and practice, is edited by Professor F. Hodge O'Neal. Although the *Commentator* is published by a commercial concern, it is assembled and manuscript is prepared in the School of Law under the direction of Professor O'Neal. The *Commentator* gives attention to matters of interest and importance to counselors and managers of corporate and other business enterprises. Primary emphasis is placed on corporation law and practice in the narrow sense, but a considerable amount of space is devoted to antitrust questions, labor matters, patents and copyrights, executives' compensation, fair trade legislation, and other matters arising out of business activities.

Organizations, Honors and Activities

THE DUKE BAR ASSOCIATION

The Duke Bar Association is the student governing organization of the Law School, and is organized along the lines of the American Bar Association. Its purpose is to introduce the student to the problems

considered by the Bar in professional organizations and to develop professional consciousness and responsibility.

The Duke Bar Association sponsors professional and social activities throughout the year. Dues are $15.00 per annum, payable in September.

ORDER OF THE COIF

A chapter of the Order of the Coif, national legal scholarship society, has been established at Duke University School of Law. Its purpose is "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." Election is restricted to the ten per cent of the graduating class who have attained the highest rank in their law school work.

MOOT COURT BOARD

A program of student Moot Court arguments is conducted under the supervision of the Moot Court Board as a part of the course in Research and Writing in which all first-year students are required to participate. In addition, a team of students is selected each year to represent the Law School in the National Moot Court competition.

INTERNATIONAL LAW SOCIETY

Recognizing the importance of the role of law in international affairs, the Duke International Law Society provides a program for examining the application of international law to world problems. Through a series of lecture-discussions in the fall called "A Short Course in International Law" and by featuring distinguished speakers in the field throughout the year, the Society provides its members the opportunity to make contact with the men and ideas that are shaping the development of international law.

Other activities include participation in the annual Philip C. Jessup International Law Moot Court competition, attendance at conferences sponsored by the Association of Student International Law Societies, and entry into various writing contests.

Membership is open to all law students at $5.00 per annum.

Recreational Facilities

The University is located about two miles from the business district of Durham on wooded hills constituting part of the five-thousand-acre Duke Forest, which is maintained by the School of Forestry. Within a short distance from the campus are facilities for golf, horseback riding and woodland hiking. Students of the Law School are entitled to the use of the University gymnasium, tennis courts, swimming pool, golf course, and similar privileges. Other opportunities

for physical activity are available through the Intramural Program as well as through such activity groups as the outing club, sailing club, cycling club and the like. Skiing has been increasingly enjoyed by various groups. Several bowling alleys are available in and near Durham. Motion pictures are shown in Page Auditorium twice a week, and concert programs, recitals, lectures, and plays are presented frequently.

Program of Instruction

First Year (Required)

	Semester Hours Fall	Spring
Business Associations I		3
Chattel Transactions	2	
Civil Procedure	3	3
Contracts	3	3
Criminal Law & Procedure	2	2
Property I	2	2
Research & Writing	1	1
Torts	3	2
	16	16

Second and Third Year

In the absence of special authorization by the Dean, each student is required to take in each semester courses aggregating not less than 12 and not more than 16 hours.

The program in the second and third years is entirely elective. In planning his elective program, the student must bear in mind that certain courses are pre-requisites to other advanced courses:

Business Associations II is pre-requisite to the Seminars in Securities Regulation and Corporate Planning and Drafting.

Conflict of Laws is a pre-requisite to the Seminar in Conflict of Laws.

Evidence is pre-requisite to Trial Practice.

Federal Taxation I is a pre-requisite to Federal Taxation II and Federal Taxation III.

Federal Taxation I, Federal Taxation III, and Property II are pre-requisites to the Seminar in Tax and Estate Planning.

Labor Relations is pre-requisite to the Seminar in Labor Law.

Trade Regulation is pre-requisite to the Seminar in Public Regulation of Business.

Constitutional Law is pre-requisite to the Seminar in Civil Liberties and Rights.

The elective courses and seminars offered in the second and third years are:

	Semester Hours	
	Fall	Spring
Comparative Laws	3	
Conflict of Laws	3	
Constitutional Law	4	
Debtors' Estates	3	
Equitable Remedies	2	
Evidence	3	
Federal Taxation I	3	3
Federal Taxation II	3	
Insurance	2	
International Law	3	
Labor Relations	3	
Legal Accounting (not offered 1965-66)	2	
Legal History (not offered 1965-66)	2	
Legal Process	3	
Military Law	2	
Municipal Corporations	2	
Negotiable Instruments	2	
North Carolina Practice	2	
Property II	4	
Securities Regulation	3	
Seminar in Criminal Law	2	
Trade Regulation	3	
Workmen's Compensation	2	
Administrative Law		3
Admiralty		3
Business Associations II		4
Civil Liberties and Rights		2
Copyright and Unfair Competition		3
Corporate Planning and Drafting		2
Family Law		2
Federal Jurisdiction		2
Federal Taxation III		3
International Economic Relations		3
International Organizations		2
Jurisprudence (not offered 1965-66)		2
Legal Profession		1
Military Law		2
North Carolina Statutes		2
Real Estate Transactions		3
Regulated Industries (not offered 1965-66)		2
Sales		3
Security		3
Seminar in Conflict of Laws		2
Seminar in Criminal Procedure		2
Seminar in Labor Law		2
Seminar in Tax and Estate Planning (not offered 1965-66)		2
Seminar in Urban Renewal		1
Social Legislation		2
State and Local Taxation		2
Trial Practice		2
Trusts		3
World Law (not offered 1965-66)		3

Individual research by students for credit, not exceeding three semester hours per year, will be permitted, subject to the approval and under the supervision of a faculty member.

Description of Courses

Business Courses

BUSINESS ASSOCIATIONS I. Legal principles concerning association in business by agency, partnership, other unincorporated forms and corporations. Creation, form and nature of agency, partnership and corporation, corporate existence (de facto corporations, corporate entity and its limitations), powers, duties, liabilities and compensation of agents, partners, officers and directors, risks in conduct of business by representatives (vicarious liability in tort, authority to contract), imputation of notice and knowledge, scope of enterprise (ultra vires), revocation and termination of authority, ratification, undisclosed business associates, stability of the associational relationship. The purpose of this course is to grasp basic principles of Agency and Partnership and introductory related principles of corporation law. (The main basic study of corporation law, however, is in Business Associations II.) Three hours a week second semester. MR. LATTY

BUSINESS ASSOCIATIONS II. Promoters, subscription to and issue of shares, stock structure and corporate capital, dividends, preferred stock, bonds, capital increases and reduction, corporate re-acquisition of own stock, elementary principles of corporate accounting, public issue of securities, stock transfers, fundamental corporate changes (recapitalization, sale, merger and consolidation, dissolution), stockholders' suits, and certain principles concerning management and operation not studied in Business Associations I. Four hours a week second semester. MR. O'NEAL

CONTRACTS. The formation and legal operation of contracts in general, with attention to problems of drafting and counseling as well as of litigation and extrajudicial settlement. Legal and equitable remedies in contract cases, including damages, specific performance, and restitutionary remedies, and important procedural devices incident to such remedies. Three hours a week throughout the year. MR. VAN ALSTYNE

SEMINAR IN CORPORATE PLANNING AND DRAFTING. The student is given hypothetical corporate problems (perhaps taken from the practicing lawyer's desk) on a client's proposed course of action; each problem is designed to require the student to grasp the business situation and goals involved, analyze for pertinent legal principles, plan the transaction to avoid legal business (including taxation) pitfalls, plan the requisite steps to consummate the desired transaction, draft the appropriate papers and present his research. Two hours a week second semester. MR. O'NEAL

DEBTORS' ESTATES. Comparative study of methods used for the liquidation of debtors' estates. The nonbankruptcy materials cover individual creditor's rights by attachment, garnishment, execution, creditors' bills and the like; common law composition; and general assignments. The bankruptcy materials cover, in the main, the first seven chapters of the Bankruptcy Act. Three hours a week first semester. MR. SHIMM

INSURANCE. The nature of "insurance"; government supervision and control; types of insurance organization; the legal requirement of insurable interest; interests of others than the named insured; the measure of indemnity; subrogation; the beneficiary's interest in life insurance; the insured event and excepted causes; warranties, representations and concealment; the making of insurance contracts; waiver, estoppel and election. Two hours a week first semester. MR. JOHNSTON

INTERNATIONAL ECONOMIC RELATIONS. See Public Law Courses, page 35, for description.

LEGAL ACCOUNTING. An examination and analysis of accounting principles and practices necessary for reasonably effective collaboration with accountants on

problems requiring the work of both lawyers and accountants. The course is designed to develop in the student an understanding of how an accountant's work is used by top management in making decisions, by government in making and enforcing regulations, and by investors and lenders in exercising a discriminating choice in the employment of their funds. (Not offered in 1965-66.)

NEGOTIABLE INSTRUMENTS. Study of the rules of the law merchant and the provisions of the Negotiable Instruments Law and the Uniform Commercial Code relating to the functions and legal incidents of checks, bills of exchange, promissory notes, and similar commercial instruments. Two hours a week first semester. MR. SHIMM

SALES. Study of the rules of the common law and the provisions of the various uniform acts and the Uniform Commercial Code relating to warranties, risks, remedies for breach, financing, and other legal problems arising in the sale of goods. Three hours a week second semester. MR. SHIMM

SEMINAR IN PUBLIC REGULATION OF BUSINESS. See Public Law Courses, page 35, for description.

SECURITIES REGULATION. See Public Law Courses, page 34, for description.

TRADE REGULATION. See Public Law Courses, page 35, for description.

Property Courses

CHATTEL TRANSACTIONS. This course uses the field of Personal Property and the traditional title-passing rules of Sales to appraise judicial reasoning and legal concepts. It serves both as a low-level course in judicial methodology and an introduction to commercial law. It deals with possession and title of chattels, the bailment relationship, artisan's lien, transfer of chattels by gift and miscellaneous inter-vivos transactions. It does not go into details of enforcement of buyers' and sellers' rights or sales financing. Two hours a week first semester. MR. LATTY

PROPERTY I. The basic concepts of real property law and conveyancing. Historical background; estates in land, including the fee simple, the fee tail with its statutory substitutes, the life estate, the estate for years and other non-freeholds; concurrent ownership; types of future interests; conveyances before and after the Statutes of Uses; landlord and tenant; the modern deed—kinds, delivery, description, title covenants; covenants and agreements running with the land at law and in equity; easements; recording and title registration. Two hours a week throughout the year. MR. BOLICH

PROPERTY II. The various rules and concepts governing transmission of property from one generation to another, including the materials normally covered in the traditional courses on Wills and Future Interests. Historical background; intestate succession at common law and under modern statutes; limitations upon testamentary power; execution and revocation of wills; contest of wills; lapse, ademption and satisfaction; future interests, comprising reversions, remainders, executory interests, rights of entry, possibilities of reverter, and their incidents; class gifts; powers of appointment; rule against perpetuities and other restrictions on the creation of interests; construction of wills and deeds. Four hours a week first semester. MR. BOLICH

REAL ESTATE TRANSACTIONS. Aspects of real estate practice including land-use development through private devices involving restrictive covenants, easements, conditions and other concepts; public control by zoning and subdivision legislation; public-private developments such as urban renewal; and some special problems, including cooperative apartments and shopping centers. Three hours a week second semester. MR. BOLICH

SECURITY. Mortgage and security interests in real property, and suretyship. Three hours a week second semester. MR. SHIMM

SEMINAR IN TAX AND ESTATE PLANNING. Seminar devoted to problems and techniques of tax and estate planning. Enrollment limited. Two hours a week second semester. (Not offered in 1965-66.)

TRUSTS. The nature, creation and elements of a trust; character and transfer of the beneficiary's interest; charitable trusts; administration of trusts; termination and modification of trusts; liabilities to and of third persons; enforcement of trusts; and constructive and resulting trusts. Three hours a week second semester.
MR. JOHNSTON

Public Law Courses

ADMINISTRATIVE LAW. The formulation of statutory schemes of administrative regulations: the organization of administrative agencies; the determination, promulgation and enforcement of administrative programs; the respective spheres of administrative and judicial responsibility; judicial control over administrative action. Practice and procedure before administrative agencies: informal conferences and negotiations; formal hearings; constitutional limitations. Three hours a week first semester. MR. HAVIGHURST

SEMINAR IN CIVIL LIBERTIES AND CIVIL RIGHTS. Studies in the field of personal liberties (freedom of speech, press, religion, association, etc.) and in the field of civil rights (right to non-discriminatory treatment, right to fairness in procedure, etc.). The seminar will be concerned with issues about which the law is unsettled, and especially with issues raised in cases pending before the Supreme Court of the United States. Two hours a week first semester. MR. WALLACE

CONSTITUTIONAL LAW. The distribution of and limitations upon governmental authority under the Constitution of the United States. Included are study of the doctrine of judicial review of legislative and executive action; the powers of Congress and the President; the limitations on State governmental powers resulting from the existence or exercise of Congressional power; and judicial protection against the exercise of governmental power in violation of rights, liberties, privileges, or immunities conferred by the Constitution. Four hours a week first semester. MR. VAN ALSTYNE

COPYRIGHT AND UNFAIR COMPETITION. Legal problems arising in the production, marketing, and distribution of literary, artistic, musical, and related achievements. While the course will be concerned primarily with statutory and common law copyright, it will include study of the law of unfair competition, including legal protection of trade marks and trade names, and some comparison of copyright with the law of patents and design patents. Three hours a week second semester. MR. WALLACE

CRIMINAL LAW AND PROCEDURE. An introductory study of the law of crimes and the administration of criminal justice; analysis of the criminal act and the mental element in crime; consideration of specific offenses as defined by statute and the common law; discussion of typical defenses in relation to specific crimes; study of the elements of Anglo-American criminal procedure. Two hours a week throughout the year. MR. LIVENGOOD

SEMINAR IN CRIMINAL LAW. Current problems in administering criminal justice, including studies of theory and technique in criminal procedure (investigation, prosecution and defense of criminal charges), inquiry into basic policy in the use of criminal sanctions for the promotion of public order, consideration of contemporary developments (legislative, judicial and administrative) in substantive and adjective criminal law, and analysis of specific problem areas such as mental responsibility, sexual deviation, attempts, and vicarious liability. Two hours a week first semester. MR. LIVENGOOD

SEMINAR IN CRIMINAL PROCEDURE. Investigation of crime and the police practices pertinent thereto, including detention and arrest, interrogation, search and seizure; exclusionary rules of evidence; motions for continuence, change of venue, and challenges to the jury; problems of the indigent defendant; discovery problems in criminal trials; post-trial appellate procedures. Two hours a week second semester. MR. EVERETT

FEDERAL JURISDICTION. A study of the federal courts with respect to the part played by them in achieving a workable federalism. Special attention will be given to the original jurisdiction of the federal district courts, the relationship of

the federal courts to state courts and state law, and the permissible and desirable range of federal judicial power. Two hours a week second semester. MR. PASCHAL

FEDERAL TAXATION I. An introduction to federal taxation with emphasis on the federal income tax. The topics considered include such basic concepts of income taxation as taxable income, deductions, the taxable person, accounting for income and deductions, computation of the tax, and capital gains and losses. Three hours a week each semester. MR. LOWNDES

FEDERAL TAXATION II. A continuation of Federal Taxation I. Among the topics considered are the taxation of corporations and corporate distributions, corporate reorganizations and readjustments, the personal holding company surtax and the accumulated earnings tax, the taxation of partnerships, and of corporations electing to be taxed as partnerships. Three hours a week first semester. MR. LOWNDES

FEDERAL TAXATION III. The principal emphasis of the course is on the federal estate and gift taxes. Consideration is also given, however, to the related portions of the federal income tax dealing with the taxation of the income of estates and trusts and income in respect of a decedent. Three hours a week second semester. MR. LOWNDES

INTERNATIONAL ECONOMIC RELATIONS. Legal framework of U. S. foreign trade and investment; foreign trade and investment laws of selected foreign countries; function of international economic law; international economic agreements; problems of foreign trade and investments. Three hours a week second semester. MR. BAADE

INTERNATIONAL LAW. A survey of public international law of peace, as evidenced especially in decisions of national and of international courts; the drafting and interpretation of treaties; the nature of handling of international claims; the organization and jurisdiction of international tribunals, with special reference to the International Court of Justice; developments with respect to the codification of the law. Three hours a week first semester. MR. BAADE

LABOR RELATIONS. A study of the law relating to collective bargaining and concerted labor activities, including the National Labor Relations Act and related legislation, the legal aspects of strikes, boycotts and picketing, the negotiation and administration of collective bargaining agreements, procedures for the settlement of labor disputes, and relations between the union and individual employees. Three hours a week first semester. MR. LIVENGOOD

MUNICIPAL CORPORATIONS. State legislative creation and control of local governmental units, municipal police power, limitations on taxation, indebtedness, and expenditures of funds, bond issues, tort liability, annexation, eminent domain, subdivision regulation, public housing, and urban renewal. Considerable field work is planned. Two hours a week first semester. MR. EVERETT

SECURITIES REGULATION. A study of the federal and state securities laws and the industry they govern, with emphasis on the mechanics and regulation of the distribution process and trading in securities; subjects dealt with include the functions of the Securities and Exchange Commission, registration and disclosure requirements and related civil liabilities, "blue sky" laws, proxy solicitation and reporting requirements, broker-dealer regulation, the self-regulatory functions of the exchange, and the regulation of investment companies. Three hours a week first semester. MR. HAVIGHURST

SEMINAR IN LABOR LAW. An intensive examination of significant problems in collective bargaining, union-management relations and labor dispute settlement, with emphasis upon the drafting and interpretation of contract clauses, theories and techniques in contract negotiation, grievance handling, voluntary arbitration and other procedures for the adjustment of disputes, and the inter-relation of the legal and economic aspects of labor problems. Two hours a week second semester. MR. LIVENGOOD

SEMINAR IN LAW AND POLITICS. Directed research and study of selected materials on the constitutional and other legal problems involved in such topics as legislative apportionment; federal protection of voting rights; political activities of government employees and of organizations such as labor unions, corporations, and trade associations; defamation of or by governmental officials or candidates for

public office, etc. Legal questions relating to the acquisition or loss of United States citizenship and the consequences thereof are also within the possible range of subject matter. Two hours a week second semester. MR. WALLACE

SEMINAR IN LEGISLATION. Studies in the legislative process and in the drafting and interpretation of statutes. Included will be exercises in legislative drafting in addition to study of selected materials on such subjects as lobbying, legislative procedures, legislative investigations, legislative-administrative relations, and statutory interpretation. Two hours a week second semester. MR. WALLACE

SEMINAR IN MILITARY LAW. A study of military jurisdiction, the rights of military personnel, the body of both substantive and procedural law that has developed under the Uniform Code of Military Justice; in addition to its other goals, the seminar will seek to develop skills in statutory interpretation and to encourage comparisons between civilian and military criminal law administration. Two hours a week first semester. MR. EVERETT

SEMINAR IN REGULATED INDUSTRIES. Selected studies of government economic regulation in such regulated industries as transportation, broadcasting, and power, plus directed research and writing in specific problems of trade regulation. (Not offered in 1965-66.)

SEMINAR IN URBAN RENEWAL. A study of the urban renewal program, as implemented at the federal and local levels. Extensive field work is planned and urban renewal officials will meet with members of the seminar to discuss problems of implementing an urban renewal program. One hour a week second semester. MR. EVERETT

SOCIAL LEGISLATION. Contemporary public welfare law, with emphasis on government regulation of conditions of employment, including the Fair Labor Standards Act and other wage-hour and child-labor statutes, unemployment insurance and other social security legislation, employers' liability and workmen's compensation acts, and related laws establishing minimum standards for the creation, continuance and termination of the employment relationship. In addition to other objectives, the course will seek to develop skills in legislative advocacy and procedure, and in the drafting and interpretation of statutes. Two hours a week second semester. MR. LIVENGOOD

SEMINAR IN TAX AND ESTATE PLANNING. See Property Courses, page 32, for description.

STATE AND LOCAL TAXATION. Constitutional limitations on the taxing power; jurisdiction to tax; state excise taxes; and the general property tax. Two hours a week second semester. MR. VAN ALSTYNE

TRADE REGULATION. A study of the federal antitrust laws and their common law background, with emphasis on the economic policies involved, and of specific unfair trade practices and unlawful restraints at common law and under state and federal statutes. Attention is given to a critical examination of legislation designed to enforce competition as the primary control of the economic system; legal measures that supplement or replace competition; the relation of patents and antitrust; price discrimination; fair trade laws; regulation of advertising; trademarks and trade-names; appropriation of trade values; boycotts; and disparagement. Three hours a week first semester. MR. WALLACE

SEMINAR IN WORKMEN'S COMPENSATION. The main elements of Workmen's Compensation Law of the United States are covered through the assignment of typical office problems on which legal memoranda or opinions are prepared. Two hours a week second semester. MR. LARSON

SEMINAR IN WORLD LAW. This is a discussion seminar open to students of the Law School and the Political Science Department, and to a limited number of other students with satisfactory backgrounds. The emphasis of this course is around those aspects of National law and International law which have an important influence on weakening or strengthening a world legal order. Detailed attention is given to the United States judicial decisions, other laws, and relevant policies effecting the relation of the United States to such a world legal system. Special attention is also given to decision of the International Court of Justice and to Constitutional treaties. The course will not duplicate the material in the regular

course on International Law. Efforts are made through the seminar discussions to develop an adequate concept of world law. Three hours a week first semester. (Not offered in 1965-66.)

General Courses

ADMIRALTY. The special body of law governing maritime affairs, especially the transportation of goods and passengers by water. Admiralty jurisdiction; marine insurance; carriage of goods; charter parties; general average; rights of injured seamen and others; collision; salvage; maritime liens and ship mortgages; limitation of liability; governmental activity in shipping. Three hours a week second semester. MR. CURRIE

COMPARATIVE LAW. An examination and comparison of the law of selected jurisdictions on certain specific topics. The history, sources, and methods of the civil law will be investigated, discussed, and compared with those of common law countries. Three hours a week first semester. MR. BAADE

CONFLICT OF LAWS. A study of the special problems which arise when the significant facts of a case are connected with more than one jurisdiction. Recognition and effect of foreign judgments; choice of law; federal courts and conflict of laws; the United States Constitution and conflict of laws. Three hours a week first semester. MR. CURRIE

EQUITABLE REMEDIES. A survey of equitable remedies in general (including enforcement of equity decrees) and of important parts of the fields of equity and restitution that are not covered in other courses. Two hours a week first semester. MR. PASCHAL

FAMILY LAW. Marriage; annulment; divorce; separation; property rights. Two hours a week second semester. MR. BAADE

JURISPRUDENCE. Discussion of some of the basic problems of classical and contemporary juristic theory, with applications to cases and statutes. Open to all graduate students, and, with the consent of the instructor, to qualified second and third year students. Three hours a week second semester. (Not offered in 1964-65.)

LEGAL HISTORY. A study of the development of fundamental English and American legal institutions, with primary emphasis upon the establishment and growth of American law from the colonial period to the present. Two hours a week second semester. (Not offered in 1964-65.)

THE LEGAL PROCESS. A study of problems in the making and application of law and of the institutions for solving those problems. This has been called a course in "working jurisprudence." It deals with major jurisprudential concepts, not in the abstract but in an attempt to put them to work in the solution of specific legal problems. The problems cut across conventional course lines and include not only those confronted by courts, but also those confronted by private persons and their counsel, legislatures, administrative agencies, public officials, and others. Three hours a week first semester. MR. CURRIE

NORTH CAROLINA STATUTES AND DECISIONS. A study of selected statutes of North Carolina with discussion of their application, and an analysis of the decisions of the Supreme Court of North Carolina construing them. Two hours a week second semester. MR. BRYSON

PATENT LAW. A short survey of the law relating to patents and trademarks, with some coverage of copyrights, primarily to give the general practitioner a foundation in these areas to collaborate effectively with specialists. Special attention is given to overlapping problems in above-mentioned areas. One hour a week first semester. (Not offered in 1964-65.)

SEMINAR IN THE CONFLICT OF LAWS. Advanced study of selected problems in the conflict of laws. Research paper required. Two hours a week second semester. MESSRS. CURRIE AND BAADE

TORTS. The bases of liability in damages for personal injuries and injuries to property; bases other than fault; negligence; intentional infliction of harm. Procedure in jury trials; proof of negligence; causation and "proximate cause"; de-

fenses. Special rules applicable to occupiers and owners of land, motor vehicle accidents, suppliers of goods and remote contractors. Misrepresentation and fraud; defamation; assault and battery; false imprisonment. Three hours a week first semester, two hours a week second semester. Mr. Hardin

Procedure and Practice Courses

CIVIL PROCEDURE. A study of the adjudication of civil cases with special emphasis on the Federal Rules of Civil Procedure. Three hours a week throughout the year. Mr. Paschal

EVIDENCE. A study of the common-law rules of evidence, including the requirements of relevancy and materiality; competency and privilege of witnesses, examination and cross-examination, burden of proof and presumptions, judicial notice, and functions of judge and jury. Three hours a week first semester. Mr. Hardin

LEGAL PROFESSION. Lectures, discussions, and reading concerning the ethical problems and professional responsibilities of the lawyer. One hour a week second semester. Mr. Hardin

NORTH CAROLINA PRACTICE. A study of the steps in a civil action at law from the issuance of process to the entry of final judgment including service of process; appearance and waiver of process; selecting the jury; various motions made during the trial; submission of case to jury; verdict; judgment; noting and perfecting appeal. Also included are such topics as jurisdiction of various courts in North Carolina; venue; trials without a jury; provisional remedies and special proceedings. Two hours a week first semester. Mr. Bryson

TRIAL PRACTICE. A study of the function of the advocate in the trial of law suits, with emphasis upon methods of pre-trial preparation and development of facts in court, typical uses of rules of procedural and substantive law in trial proceedings, and tactical and ethical aspects of problems which confront the trial lawyer. The course is open to third-year students who have completed the course in Evidence. Two hours a week second semester. Mr. Hardin

Legal Research and Writing

DUKE LAW JOURNAL. One semester-hour of credit shall be accorded for each semester of satisfactory *Law Journal* activity as a competitor or as a member of the Editorial Board other than an officer; two semester-hours of credit shall be accorded for each semester of satisfactory *Law Journal* activity as an officer of the Editorial Board.

RESEARCH AND WRITING. Classroom instruction and individual problems in the use of law books, the preparation of memorandum of law, and moot court briefing and argument. Two semester-hours credit. Mr. Johnston

Upon recommendation of the Committee on Graduate Study, seminars not listed in the Bulletin may be created or arrangements made for supervision of special research by individual graduate students in any subject.

All matters presented in this Bulletin are subject to change as the University or the School of Law may deem expedient.

ENROLLMENT 1964-1965

First Year

Adams, Charles F. (Duke University), Java, Virginia
Adams, James A. (Duke University), Roscoe, New York
Atwater, Luther E. (Duke University), Columbia, South Carolina
Auerbach, Kenneth R. (Trinity College), Rye, New York
Bacon, Richard G. (Villanova University), Wilmington, Delaware
Banks, Lawrence K. (Duke University), Greensboro, North Carolina
Barr, Stuart G. (Duke University), Staten Island, New York
Barrier, W. Christopher (Hendrix College), Little Rock, Arkansas
Beach, Lawrence W. (Bowdoin College), Sylvan, New York
Bernard, Daniel F. (Iowa State University), Kenton, Ohio
Berteau, John T. (Duke University), Lake Jem, Florida
Bibeau, Brian H. (Florida State University), Clearwater, Florida
Bolch, Carl E., Jr. (University of Pennsylvania), Jacksonville, Florida
Burkhardt, Clyde A. (Brown University), Southington, Connecticut
Burton, Robert E., Jr. (Dartmouth College), Montchanin, Delaware
Campbell, Frank A., Jr. (Duke University), Clearwater, Florida
Campbell, George R. (Harvard University), Parkersburg, West Virginia
Carter, Norman M., Jr. (Rutgers University), Plainfield, New Jersey
Cerello, Robert M. (Pomona College), Covina, California
Chiles, Stephen M. (Davidson College), Nokomis, Florida
Clark, Roger M. (University of Utah), Hagerstown, Maryland
Collier, Calvin (Grinnell College), Berwyn, Illinois
Collins, Patrick H. (Colgate University), Gouverneur, New York
Connolly, John R. (Williams College), Verona, New Jersey
Cooper, Norman G. (The Citadel), Bethesda, Maryland
Craven, Donald B. (University of North Carolina), Roxboro, North Carolina
Craven, James B., III (University of North Carolina), Morganton, North Carolina
Crill, John L. (Allegheny College), Mercer, Pennsylvania
Croft, Thomas C. (University of South Carolina), Columbia, South Carolina
Davis, Linwood L. (Princeton University), Winston-Salem, North Carolina
Davis, William A., II (University of North Carolina), High Point, North Carolina
Dawson, Grayce B. (Duke University), Durham, North Carolina
Dillon, W. Lyman (Davidson College), High Point, North Carolina
Douglass, Joseph D. (Cornell University), Cleveland, Ohio
Durham, James R. (Wabash College), Munster, Indiana
Evans, Robert J. (Georgetown University), Rome, Georgia
Faulkner, Douglas A. (Earlham College), Ho-Ho-Kus, New Jersey
Fink, Joseph A. (Oberlin College), Detroit, Michigan
Fischer, Dennis J. (Vanderbilt University), Decatur, Georgia
Fischer, James C. (Florida State University), Orlando, Florida
Fromholz, Haley J. (New York University), Darien, Connecticut
Genders, Curtis D. (Florida State University), Sarasota, Florida
Gordon, Richard A. (New York University), West Hempstead, L.I., New York
Gormley, Thomas J. (Amherst College), Hartford, Connecticut
Grissom, Hubert A., Jr. (Birmingham-Southern College), Cullman, Alabama
Guthrie, George G. (Duke University), Charleston, West Virginia
Hackett, Robert J. (Rutgers University), Allendale, New Jersey
Hale, John S. (Ohio University), Suitland, Maryland
Hamilton, J. Robert (Wabash College), Crawfordsville, Indiana
Hash, Edward (Duke University), Arlington, Virginia
Hazen, Edwin R. (Lehigh University), Erie, Pennsylvania
Heinly, James F. (Gettysburg College) Lancaster, Pennsylvania
Hoernecke, Lutz B. (Columbia College), Williston Park, New York
Hopper, Frederick C. (Beloit College), Taylorsville, Illinois
Hunter, Robert C. (University of Pittsburgh), Pittsburgh, Pennsylvania
Johnson, Hervey M. (Princeton University), Lumberton, North Carolina
Johnson, Robert A. (Duke University), Hopewell, Virginia
Jorgensen, Thomas A. (Columbia University), Silow Springs, Maryland
Klingelhofer, Stephan E. (Yale University), Bethesda, Maryland
Kuter, Stanley J. (Fordham University), Port Chester, New York
Lathrop, Peter K. (Hamilton College), Ellenville, New York
Lewis, Emmett B., III (Duke University), Akron, Ohio
Lewis, John H. (University of Florida), Orlando, Florida
Lincoln, Donald R. (Cornell University), Attica, New York
Livingston, Farrand M. (Kenyon College), Worthington, Ohio
Lockwood, John A. (Colby College), Wilmington, Delaware
McAllister, Robert W. (Monmouth College), DeKalb, Illinois
McArthur, Matthew R. (Knox College), Park Forest, Illinois
McCoy, Terrence L. (Dartmouth College), Louisville, Kentucky
Mahoney, George R., Jr. (Ohio Wesleyan University), Southampton, L.I., New York
Melton, Thomas H. (Duke University), Huntington, West Virginia
Meyers, David (Tulane University), St. Petersburg, Florida
Moran, Charles A. (Georgetown University), Columbia, South Carolina

Moye, Robert J. (Washington and Lee University), Arlington, Virginia
Mullen, James N. (Duke University), Gastonia, North Carolina
Nabers, Wallace J. (Duke University), Wilson, North Carolina
Nathanson, Paul S. (Tulane University), North Miami, Florida
Norfolk, William R. (Miami University), Cincinnati, Ohio
Pancoast, David W. (College of Wooster). Lambertville, Michigan
Parker, Thomas (Davidson College), Greenville, South Carolina
Pieper, Nathaniel G. W. (Washington University), Coeur D'Alene, Idaho
Poe, Douglas (DePauw University), Flossmoor, Illinois
Remsburg, F. Raine (University of North Carolina), Goldsboro, North Carolina
Rich, Wayne A., Jr. (Colgate University), Charleston, West Virginia
Rieder, Robert W., Jr. (Willamette University), Portland, Oregon
Riffle, Alan E. (Stetson University), DeLand, Florida
Riley, William L. (Williams College), Garden City, New York
Rogers, William K. (University of Arizona), Tucson, Arizona
Roth, Steven M. (Pennsylvania State University), Elkins Park, Pennsylvania
Serterides, Louis (Rutgers University), Jersey City, New Jersey
Sheahan, Robert E. (Illinois Wesleyan), Riverdale, Illinois
Sheffield, Homer G. (Duke University), Columbia, South Carolina
Shelfer, William S., Jr. (North Georgia College), Atlanta, Georgia
Sherman, Roger (Princeton University), Warrington, Florida
Singer, William B. (Georgetown University), Cincinnati, Ohio
Smith, Hugh N. (Lawrence College), Delaware, Ohio
Smith, Lanty L. (Wittenberg University), Sherrodsville, Ohio
Steinbrink, William H. (Wittenberg University), Richmond, Indiana
Street, Malcolm B., Jr. (Birmingham-Southern College), Anniston, Alabama
Stronach, George T., III (Atlantic Christian College), Wilson, North Carolina
Stubbs, Trawick H., Jr. (University of North Carolina), Atlanta, Georgia
Taylor, John C. (Juniata College), Huntington, Pennsylvania
Thomasch, Roger P. (College of William and Mary), Philadelphia, Pennsylvania
Todd, Daryl F. (University of Pennsylvania), Beach Haven, New Jersey
Tracy, W. Ferber (Duke University), Salisbury, Connecticut
Vieregg, Arthur B. (Duke University), Arlington, Virginia
Warnick, Reed T. (Brigham Young University), Wheatridge, Colorado
Ward, Mitchell E., III (University of Mississippi), Vicksburg, Mississippi
Wildermuth, John G. (United States Military Academy), Ft. Bragg, North Carolina
Williams, Terry L. (Ball State Teachers College), Anderson, Indiana
Wish, Norman J. (Syracuse University), East Chester, New York
Womble, William F., Jr. (Duke University), Winston-Salem, North Carolina
Yule, Dennis D. (Seattle Pacific College), Shelton, Washington

Second Year

Adelson, Andres E. (Washington and Lee University), Baltimore, Maryland
Albert, Burton L. (Dartmouth College), Sioux City, Iowa
Allen, Richard M. (Purdue University), Park Ridge, Illinois
Alsentzer, William J. (Duke University), Wilmington, Delaware
Anderson, Bruce H. (Duke University), Thomasville, Georgia
Axelrod, Charles D. (Colgate University), Bellmore, New York
Bader, W. Reece (Williams College), Portland, Oregon
Baier, Alan L. (Williams College), Bellport, New York
Benson, George J. (Lafayette College), New Shrewsbury, New Jersey
Blanco, David B. (Duke University), Winston-Salem, North Carolina
Bloom, David W. (University of South Carolina), Columbia, South Carolina
Branch, Barrington H. (Davidson College), Atlanta, Georgia
Brannen, George W. (Dartmouth College), Geneva, Illinois
Brooks, Earle L. (Miami University), Columbus, Ohio
Buhrman, Richard W. (University of Chattanooga), Chattanooga, Tennessee
Cabe, Robert D. (Hendrix College), Benton, Arkansas
Cairns, John A. (Carleton College), Greenville, Delaware
Carson, J. Van (Mount Union College), Canton, Ohio
Cawood, Harry E. (Wheaton College), Newton, Iowa
Connard, Carroll S. (Williams College), New Hope, Pennsylvania
Conroy, Dale D. (Duke University), Bethpage, New York
Courter, James A. (Colgate University), Essex Falls, New Jersey
Davis, R. Kennedy (Ohio Wesleyan University), Findlay, Ohio
Denson, Alexander B. (North Carolina State College), Richmond, Virginia
Detrick, Judson W. (DePauw University), LaGrange, Illinois
Etz, Winton O., Jr. (Miami University), Xenia, Ohio
Evans, John E. (University of Louisville), Wyommissing, Pennsylvania
Feinstein, Miles R. (Rutgers University), Camden, New Jersey
Field, Michael W. (Georgetown University), Washington, D.C.
Fink, Jerold A. (Duke University), Dayton, Ohio
Fowlkes, Hal T., Jr. (Millsaps College), Wiggins, Mississippi
Fox, Henry H. (Florida State University), Miami, Florida
Ganotis, John (Syracuse University), Jamesville, New York
Gaskins, Eura DuVal, Jr. (Wake Forest College), Monroe, North Carolina
George, Robert M. (North Carolina State College), Mercer Island, Washington
Gilley, Dewey C., Jr. (Davidson College), Leaksville, North Carolina

Gold, Peter S. (Duke University), Shelby, North Carolina
Goodson, James M. (Duke University), Mt. Olive, North Carolina
Haddon, Harold A. (Albion College), Fenton, Michigan
Harrington, Anthony S. (University of North Carolina), Charlotte, North Carolina
Harriss, William G. (University of North Carolina), Burlington, North Carolina
Hart, William J. (Drury College), Republic, Missouri
Hawke, Russell J., Jr. (Drew University), Endwell, New York
Hayes, L. Mifflin (Kenyon College), Rahway, New Jersey
Hedden, Andrew S. (Hamilton College), Short Hills, New Jersey
Heiser, Lawrence C. (University of Southern California), Santa Monica, California
Hillman, George A. (Yale University), Batesville, Indiana
Hole, Allen D., III (Earlham College), Richmond, Indiana
Holmes, William K. (Augustana College), Wataga, Illinois
Horsch, Christopher J. (University of the South), Newnan, Georgia
House, Donald R. (Duke University), Monroe, North Carolina
Howe, Jonathan T. (Northwestern University), Des Plaines, Illinois
Huber, John L. (Dartmouth College), Pittsburgh, Pennsylvania
Hunoval, Mathias P. (Lehigh University), South Orange, New Jersey
Hutton, E. Jeremy (Colgate University), Hillsdale, New Jersey
Jacobson, James C. (Emory College), Miami Beach, Florida
Johnson, William L., Jr. (Duke University), Mt. Gilead, North Carolina
Jones, Marshall R., Jr. (University of Nebraska), Lincoln, Nebraska
Lewis, F. Sherwood (Duke University), Falls Church, Virginia
Long, Don B., Jr. (Columbia University), Roanoke, Alabama
Lynch, Michael F. (Notre Dame University), Atlanta, Georgia
McCaughan, Ralph L. (Duke University), Fort Lauderdale, Florida
McClatchey, Devereaux F. (Brown University), Atlanta, Georgia
McCoy, Jerry J. (West Virginia University), Parkersburg, West Virginia
McDonald, Daniel M. (Brown University), Fall River, Massachusetts
Maxwell, James B. (Randolph-Macon College), Newport News, Virginia
Michaux, Eric C. (Boston University), Durham, North Carolina
Michel, Peter J. (St. Francis College), Bronx, New York
Miller, Michael L. (Ohio University), Miamisburg, Ohio
Miller, Steven L. (Yale University), Sioux City, Iowa
Moore, Roy W. (Harvard University), Fairfield, Connecticut
Morgan, Thomas H. (Duke University), Garden City, New York
Morris, Joel J. (Duke University), Raleigh, North Carolina
Noble, David D. (College of Wooster), Wooster, Ohio
Nurkin, Sidney J. (Duke University), Durham, North Carolina
Osteen, Carolyn M. (Wellesley College), Richmond, Virginia
Paddock, Ben L. (University of the South), Fort Smith, Arkansas
Palmer, Richard A. (Yale University), Wethersfield, Connecticut
Perry, Spence W. (Harvard University), Jacksonville, Florida
Peters, David F. (Washington and Lee University), Hagerstown, Maryland
Phillips, T. Stephen (DePauw University), Tennyson, Indiana
Pitcher, Thomas B. (University of Florida), Tombstone, Arizona
Porter, T. William (Southern Methodist University), Bellaire, Texas
Richards, Channing O. (University of North Carolina), Charlotte, North Carolina
Rickards, Edward S. (Duke University), Milltown, New Jersey
Robin, Edward B. (University of Florida), Jacksonville, Florida
Roos, Robert C. (Wabash College), Elmwood Park, Illinois
Schlegel, H. James (Mount Union College), South Mountain, Pennsylvania
Scott, Robert H., Jr. (Kenyon College), Prairie Village, Kansas
Semonche, John (Brown University), Chapel Hill, North Carolina
Shaw, Peter L. (Northwestern University), Webster Groves, Missouri
Smith, Richard A. (Colgate University), Syracuse, New York
Snodgrass, Richard A. (Yale University), Erie Pennsylvania
Snow, Armil L. (University of Arkansas), Fayetteville, Arkansas
Spangler, Robert W. (Pennsylvania State University), McKeesport, Pennsylvania
Story, Joseph A. (Miami University), Hamilton, Ohio
Varner, K. Morgan (Princeton University), Auburn, Alabama
Wehrle, Richard T. (Duke University), Charlotte, North Carolina
Wheeler, Douglas P. (Hamilton College), Huntington, New York
Whitman, Dale A. (Brigham Young University), Charleston, West Virginia
Wies, Thomas N. (Yale University), Branford, Connecticut
Willard, William G., III (Princeton University), Spartanburg, South Carolina
Williams, Neil C., Jr. (Duke University), Asheboro, North Carolina
Woodcock, Donald F. (Kent State University), Akron, Ohio
Yarrington, S. Christine (Millikin University), Keokuk, Iowa

Third Year

Addlestone, David F. (University of North Carolina), Sumter, South Carolina
Aiesi, Donald P. (Stetson University), Reading, Massachusetts
Alder, Jonathan (Princeton University), Chester, West Virginia
Archie, Peter B. (University of North Carolina), Kinston, North Carolina
Bacsak, Peter (Princeton University), New York, New York
Bateman, Charles L. (Elon College), Burlington, North Carolina
Berner, Robert (DePauw University), Ticonderoga, New York

Bogle, Robert A. (Brown University), Fall River, Massachusetts
Breazeale, Francis I. (University of Virginia), Hendersonville, North Carolina
Brigati, Joseph J. (Notre Dame University), Syracuse, New York
Briggs, Michael G. (Alaska Methodist University), Anchorage, Alaska
Brown, Peter O. (Amherst College), Ithaca, New York
Burleigh, Reginald E. (Bowdoin College), Caribou, Maine
Campbell, Charles G. (Albion College), Adrian, Michigan
Carpenter, Randle B. (Duke University), Raleigh, North Carolina
Cartwright, Thomas C. (University of North Carolina), Elizabeth City, North Carolina
Clark, Thomas B. (University of Rochester), Lexington, Kentucky
Cohen, D. David (Brooklyn University), Brooklyn, New York
Coughlan, Patrick C. (Duke University), Boca Raton, Florida
Crenshaw, Kerry (The Citadel), Anderson, South Carolina
Curtis, William M. (Wesleyan University), Valley Stream, New York
Dansby, Gerald D. (Rice University), Riverside, California
Detweiler, Robert E. (Lafayette University), Easton, Pennsylvania
Edgar, Robert A. (Davidson College), Athens, Tennessee
Edmonds, Thomas A. (Mississippi College), Jackson, Mississippi
Ervin, Paul R., Jr. (Duke University), Charlotte, North Carolina
Farr, Samuel W. (Syracuse University), Big Flats, New York
Gardiner, Donald B. (DePauw University), Cedar Rapids, Iowa
Garrenger, Robert L., Jr. (University of Pennsylvania), Plainfield, New Jersey
Gerde, Jerome W. (University of Indiana), Crown Point, Indiana
Gilchrist, Peter S. (University of North Carolina), Chapel Hill, North Carolina
Graves, Thomas W., Jr. (Duke University), Wilson, North Carolina
Hickey, James C. (Vanderbilt University), Hopkinville, Kentucky
Hines, John M. (Duke University), Kinston, North Carolina
Hjelmfelt, David C. (Kansas State University), Shawnee, Kansas
Hughes, Jeffrey P. (Wesleyan University), Jenkintown, Pennsylvania
Hunger, Frank W. (University of Mississippi), Winona, Mississippi
King, William D. (Duke University), Hueytown, Alabama
Kleinschmidt, Thomas C. (Westminster College), Clayton, Missouri
Klute, Lawrence W. (Grinnell College), Three Oaks, Michigan
Lear, William H. (Yale University), Monessen, Pennsylvania
Lougee, David L. (Bates College), Shrewsbury, Massachusetts
McGeary, Raymond T. (Muskingum College), Cheswick, Pennsylvania
MacPhail, Douglas F. (Dartmouth College), Englewood Cliffs, New Jersey
Marquardt, Emil C. (Notre Dame University), Clearwater Beach, Florida
Matthies, Eric F. (Dartmouth College), Fort Lauderdale, Florida
Meehan, Thomas P. (Middlebury College), North Bergen, New Jersey
Memory, Thomas (North Carolina State University), South Bend, Indiana
Mewhort, Don M., Jr. (Duke University), Toledo, Ohio
Mikesell, Richard L. University of California), Sacramento, California
Mills, Charles B. (Ohio Wesleyan University), Marysville, Ohio
Morgan, Richard M. (Davidson College), Hamlet, North Carolina
Moyer, Jay E. (Dartmouth College), Washington, D.C.
Myers, Geoffrey R. (Princeton University), Haworth, New Jersey
Nelms, Gary T. (South West Missouri State University), Springfield, Missouri
Norton, William J. (Cornell University), Grand Isle, Vermont
Owens, Thomas P., Jr. (Air Force Academy), Grifton, North Carolina
Parker, Roy T. (Yale University), Pelham, New York
Peyton, Gordon P. (University of the South), Arlington, Virginia
Piper, James P. (Rice University), Houston, Texas
Prather, Mark D. (Duke University), Meadville, Pennsylvania
Rankin, Robert (Duke University), Durham, North Carolina
Reid, E. Lowry (Davidson College), Columbus, Georgia
Revelos, Constantine (Bowdoin College), Middletown, Ohio
Ross, J. David (Ohio Wesleyan University), Chillocothe, Ohio
Rufe, John J. (Lafayette College), Sellersville, Pennsylvania
Seeber, Ronald G. (Hamilton College), Elmira, New York
Shailer, Philip S. (Yale University), New York, New York
Sims, Edgar H. (Davidson College), Toccoa, Georgia
Sink, Robert C. (Duke University), Raleigh, North Carolina
Smith, Edwin W. (Auburn University), Auburn, Alabama
Smith, Gibson L. (Davidson College), Charlotte, North Carolina
Smith, Spencer B. (College of Wooster), Camp Hill, Pennsylvania
Smyth, Ross J. (Davidson College), Charlotte, North Carolina
Speer, William (Duke University), Charlotte, North Carolina
Stanton, Robert (Colgate University), Williamson, New York
Stevenson, Ward B. (Duke University), Durham, North Carolina
Stokes, James C. (Duke University), Salisbury, North Carolina
Strickland, Carter (Dartmouth College), Oneida, New York
Toms, Robert (Bob Jones University), Hendersonville, North Carolina
Unterman, Edan G. (Princeton University), Rockville Centre, New York
Vincent, Richard H. (Duke University), Orange Park, Florida
Ward, Craig B. (Rollins College), Winter Park, Florida
Warren, Joseph (Duke University), Sarasota, Florida
Watson, Wade T. (University of West Virginia), Gary, West Virginia
Windover, Fred (Brown University), Durham, North Carolina
Young, Robert E. (Duke University), Towson, Maryland

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DUKE STATION DURHAM, N. C.

BULLETIN
OF
DUKE UNIVERSITY



THE SCHOOL OF MEDICINE
AND
DUKE UNIVERSITY MEDICAL CENTER

ANNOUNCEMENTS FOR 1965-1966

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THE SCHOOL OF MEDICINE
AND
DUKE UNIVERSITY MEDICAL CENTER



ANNOUNCEMENTS FOR 1965-1966



BULLETIN OF DUKE UNIVERSITY
DURHAM, NORTH CAROLINA
1965

Table of Contents

Medical School Calendar 3

Officers of Administration 5

General Information 9
- Facilities 9
- Living Accommodations 13
- Student Medical Care 15
- Motor Vehicle Registration 16
- Organizations 16

Admission 20
- Application for Admission 20
- Requirements for Admission 20
- Selection 21
- Transcripts 21
- Advanced Standing 21
- Regional Representatives of the Committee on Admissions 22
- Summary for Applicants 23

Financial Information 24
- Fees and Expenses 24
- Availability of Financial Assistance for Medical Education 24
- Scholarships—Fellowships 24
- Loans 25
- Cash Awards 26

Curriculum 28
- First Year 28
- Second Year 29
- Third and Fourth Years 29
- Promotion 30
- Degrees 30

Departments of Instruction 32
- Anatomy 32
- Biochemistry 37
- Endocrinology 41
- Medicine 43

Medical Research Training Program 54
Microbiology and Immunology 56
Neurologic Sciences Program 58
Obstetrics and Gynecology 61
Pathology 67
Pediatrics 74
Physiology and Pharmacology 80
Preventive Medicine 85
Psychiatry 87
Radiology 99
Surgery 101
Undergraduate Cancer Training Program 124
Veterinary Medicine 125

Duke Hospital 126
Administrative Staff 126
Private Diagnostic Clinic Staff 126
Technical Staff and Heads of Hospital Divisions 126
Internships and Residencies 127
Postgraduate Study 128

Paramedical Courses 129
School of Cytotechnology 129
Dietetics 129
Hospital Administration 131
Medical Art and Illustration 132
Medical Technology 133
Nurse Anesthesia 136
Physical Therapy 136
Radioisotope Technology 139
Radiologic Technology 139
Prosthetic and Orthopaedic Appliances 141

Roster of Students 142

Medical School Calendar

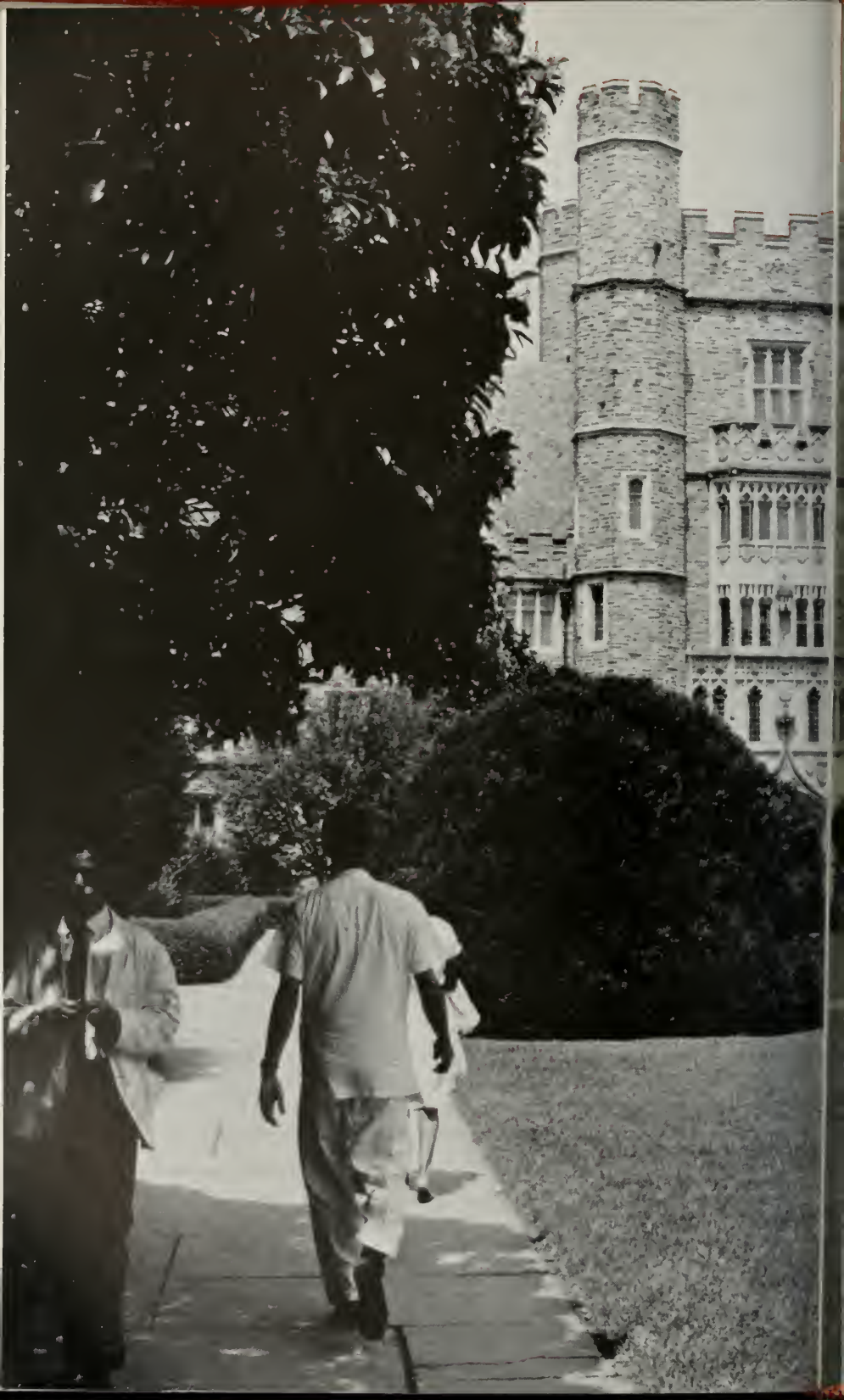
1965-1966

1965

January	4	Classes resume.
January	23	End of second term.
January	25	Begin third term.
March	27	End of third term.
March	28-April 3	Spring vacation for third and fourth year students.
March	29	Begin fourth term for first and second year students.
April	5	Begin fourth term for third and fourth year students.
April	11-17	Vacation for first and second year students.
June	5	End of fourth term.
June	7	Commencement exercises.
June	28	Registration and first day of Summer Session.
July	4	Independence Day holiday.
August	28	End of Summer Session.
September	7	Registration and first day of first term.
November	6	End of first term.
November	8	Begin second term.
November	25	Thanksgiving Day holiday.
December	18 noon	Begin Christmas holiday.

1966

January	3	Classes resume.
January	22	End of second term.
January	24	Begin third term.
March	26	End of third term.
March	27-April 2	Spring vacation for third and fourth year students.
March	28	Begin fourth term for first and second year students.
April	4	Begin fourth term for third and fourth year students.
April	10-16	Vacation for first and second year students.
June	4	End of fourth term.
June	6	Commencement exercises.
June	20	Registration and first day of Summer Session.
July	4	Independence Day holiday.
August	20	End of Summer Session.
September	6	Registration and first day of first term.
November	5	End of first term.
November	7	Begin second term.
November	24	Thanksgiving Day holiday.
December	17 noon	Begin Christmas holiday.



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Edwin Constant Bryson, LL.B., *University Counsel*

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Charles H. Frenzel, A.B., *Administrative Director, Medical Center*

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Capitola B. Mattingly, *Associate Professor of Nursing, Director of Graduate Studies*

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Louis E. Swanson, *Assistant Administrative Director, Medical Center and Associate Professor of Hospital Administration.*

Daniel C. Tosteson, *Professor of Physiology and Pharmacology.*

Four other members of the faculty holding the rank of Assistant Professor or above, by alphabetical rotation.

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William G. Anlyan, *Dean of the School of Medicine and Chairman of the Medical School Advisory Committee.*

Barnes Woodhall, *Ex Officio, Vice Provost.*

Charles H. Frenzel, *Professor of Hospital Administration and Administrative Director, Medical Center.*

Other members: The heads of all departments in the Medical School.

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Admissions

J. E. Markee (Chairman), Byrne, Cherny, Duke, Elchlepp, Fetter, Kaufman, McCollum, Osterhout, Overman, Portwood, Rhoads, Thompson.

Beaumont

D. B. Hackel (Chairman), Markee, Metzgar, Salzano, Shingleton, Whalen.

Borden Award

J. P. Hendrix (Chairman), Kamin, Kaufman, W. Smith.

Cancer Training

W. W. Shingleton (Chairman), Harris, Kinney, Laszlo, R. Parker, Reeves, A. Smith.

Cardio-Vascular Training

K. S. Grimson (Chairman), Harris, McIntosh (ex-officio), Stead, Tosteson.

Clinical Research

M. D. Bogdonoff (Chairman), Cohen, G. Davidson, Rundles, Shingleton, Stempfel, Thiers, Wyngaarden.

Clinical Service Laboratories

T. D. Kinney (Chairman), Frenzel, Osterhout, P. Smith, Thiers.

Continuation Education

W. M. Nicholson (Chairman), Baylin, Markee.

Co-ordination of Paramedical Services

H. L. Kaiser (Chairman), B. Ashbrook, Cahoon, Clark, DeMaria, Jennings, Markee, Mengel, W. W. Smith, Stephen, Tate.

Curriculum

H. O. Sieker (Chairman), Callaway, Christian, DeMaria, Glenn, Gross, Hackel, Hine, Long, Lynn, Moses, Preiss, Stempfel, Young.

Davison Scholarship Committee

E. C. Long (Chairman), Nashold, W. P. J. Peete. (Plus two student representatives).

Durham Veterans Hospital Dean's Committee

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Hanes and United Funds

D. T. Smith (Chairman), Kaufman, Long, Harris, Semans.

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Hospital Records

E. L. Persons (Chairman), Mrs. Kernodle, Miss Clark, Frenzel, Gardner, Goldner.

Isotope

P. Handler (Chairman), Baylin, Frenzel, Harris, C. Knight, Nicholson, Pircher, Reeves, Sanders, Shingleton.

Library

Mrs. J. H. Semans (Chairman), Bernheim, Bogdonoff, Cavanagh, DeTurk, Gardner, Hine, Miss Janoscrat, Long, Mrs. P. Miller, Nashold, D. T. Smith, and one student representative.

Medical Center Facilities

L. Swanson (Chairman), Cherny, Davidson, Estes, Kaufman, J. W. Moore, Miss R. Wilson, W. Wilson, Young.

Medical Education for National Defense

F. W. Clippinger (Chairman), Bassett, DeBra, Fetter, Frenzel, Georgiade, Hogsed, Hohman, Mitchell, North, Sanders, D. Smith, Stickel, B. Worde, Ex-officio Members: E. C. Long, H. Sieker.

Out Patient Policy

R. Parker (Chairman), Bogdonoff, DeMaria, Elwell, Llewellyn, W. P. J. Peete, Stickel.

Physical and Occupational Therapy

F. W. Clippinger (Chairman), Frenzel, Hall, Huckabee, Kaiser, Lowenbach, Markee, Persons.

Rehabilitation Advisory

R. A. Gregg (Chairman), Belue, Bogdonoff, Clark, Clippinger, Jennings, Kaiser, Mattingly, Nashold, Nichols, Semans.

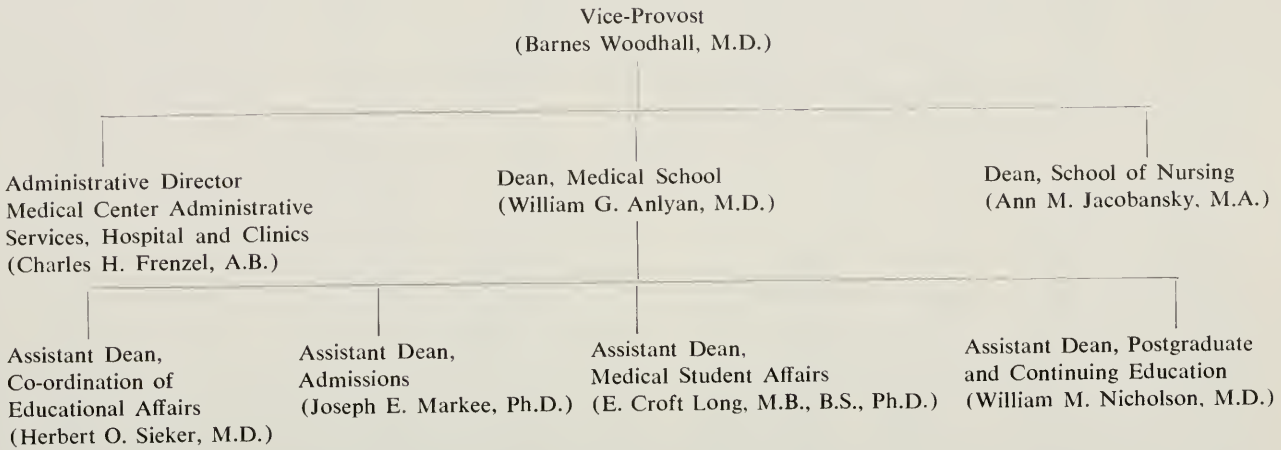
Social Service

W. M. Nicholson (Chairman), Busse, Carter, Frenzel, Harris.

Student Fellowships

E. C. Long (Chairman), Sealy, Sidbury.

ADMINISTRATION OF DUKE UNIVERSITY MEDICAL CENTER



General Information

The Duke University Medical Center is located on the campus of the University, within the city limits of Durham, and on the border of the Duke Forest. A medical school and hospital as part of the University were conceived in 1925 from the gifts of Mr. James B. Duke. Mr. Duke's Indenture states, "I have selected hospitals as another of the principal objects of this Trust because I recognize that they have become indispensable institutions." An outstanding medical scientist and educator, Dr. Wilburt C. Davison, was appointed as the first Medical School Dean. He organized the Medical Center and directed it through the formative years.

Duke Hospital was opened for patients on July 21, 1930. The first medical students were admitted October 2, 1930, beginning both a first and a third year class. The first student nurses began their studies January 2, 1931. Through the years, an extensive building program has been necessary, with construction of additional facilities for clinics, wards, classrooms, research laboratories and dormitories.

The aims of the school have remained basically the same: the development of informal and cordial student-faculty relations, emphasis on the importance of sound teaching and good medical care, the continued acquisition of new knowledge, a mutually helpful relationship with the medical profession, and service to the people of the communities of this area.

FACILITIES

University Facilities

The Medical Center is a part of the Duke University campus which provides to the students of the Medical School easy access to all the facilities of the University. These include the dormitories, dining halls, libraries and all recreational facilities. For example, the tennis courts and gymnasium are only a short walk in distance and the Sarah B. Duke Memorial Gardens are directly opposite the Medical Center.

Duke Hospital

Duke Hospital is an integral part of the Medical Center and currently has 650 beds and 30 bassinets. The hospital performs the dual functions of professional education and patient care. Comprehensive diagnostic and treatment facilities are provided. Different levels of patient care are provided, ranging from the intensive nursing unit,

through the conventional nursing sections to a minimal care unit. Private, semiprivate and ward accommodations are available. Over 20,000 patients are admitted each year. The approximate daily census by service is as follows: Surgery, including the surgical subspecialties, 250; Medicine, 160; Pediatrics, 55; Psychiatry, 45; and Obstetrics-Gynecology, 45. Surgical facilities include 18 operating rooms where over 15,000 surgical procedures are performed annually. Two obstetrical delivery rooms are maintained. Special diagnostic and treatment units are also available such as the recovery room, cardiac catheterization laboratory, and hyperbaric oxygenation chamber.

The out-patient services comprise the public clinics, the private patient clinics and employee health office, and the emergency service. Over 130,000 visits are made each year to these units. Close working relationship between Duke Hospital and various outside health agencies enhance continued care of the patients.

The clinical faculty of the Duke University School of Medicine forms the medical staff of Duke Hospital. Thus this group not only participates in both undergraduate and graduate medical education but also in active medical practice within the hospital and the private diagnostic clinics. Duke Hospital is approved for internship and residency training by the Council on Medical Education and Hospitals of the American Medical Association and conducts an active educational program involving approximately 300 housestaff members. The hospital is fully accredited by the Joint Commission on Accreditation of Hospitals.

Teaching and Research Facilities

Classroom and laboratories for clinical teaching are located throughout the Duke Hospital patient areas. The major preclinical teaching facilities are in the Medical School Unit, the Davison Building, which is physically a part of the hospital. Additional teaching and research facilities are located in the Diagnostic and Treatment Building, the Gerontology Building, the Clinical Research Building, and the William B. Bell Research Building. All except the latter are a part of a single building complex.

Veterans Hospital

The Durham Veterans Administration Hospital is located within walking distance of the School of Medicine. The fulltime professional staff are all members of the faculty of Duke University School of Medicine. This 489 bed general hospital provides an opportunity for closely integrated student teaching and housestaff training.









Library

The Medical Center Library, located in the Davison Building, attempts to provide all services and collections necessary to further educational, research and clinical activities in the medical field. Extensive reference and bibliographical service is provided. The collection exceeds 70,000 volumes and about 1300 current periodicals are being received, over one hundred of them in duplicate subscriptions.

The Trent Collection in the history of medicine is an unusually fine one, rich in manuscripts and rare books, and providing opportunity for study and research as well as casual reading in the field.

G. S. T. Cavanagh, B.A. (Manitoba, 1950), B.L.S. (McGill, 1951), *Director and Professor of Medical Literature, Curator of Trent Collection.*

Polly Gibbs Miller, A.B. (Meredith, 1950), *Assistant Librarian.*

Constance T. McDaniel, M.S. (Drexel Inst. of Technology, 1952), *Chief Cataloguer.*

Dorothy Mueller, A.B. (Birmingham-Southern, 1959), M.A. (Peabody, 1961), *Reference Librarian.*

Central Television Facility

The functions of this unit include television service directed toward the instruction, research, and patient care programs of the Medical Center. Another function is that of conducting continuing research in evaluation studies and in the development of television utilization. A collection of videotaped material is available as cores for teaching presentations. The television system is designed to enhance the multimedia approach for instruction. The television control center is capable of interdigitation of all audio and video signals originating from TV cameras, a motion picture-opaque-slide pick-up device, and videotape recorder. Mobile cameras, monitors (receivers), and the wide-screen TV projector may be used in 21 specific locations throughout the Medical Center. These locations include all major classrooms. With the use of extension cables, other locations may be reached. Four-channel capability is a built-in feature of the system. Although no formalized study in educational television is provided, individual training programs are available for those who wish to pursue medical television as a career. Consultation and training programs are designed for those who wish to utilize television in their professional activities.

Sam A. Agnello, A.B. (Duke, 1939), *Coordinator of Medical Television*

LIVING ACCOMMODATIONS

The Men's Graduate Center, within a block of the Medical Center, is available to men enrolled in the Medical School. The rooms are furnished for two persons, and the rental charge for a double room is

$520.00 for the academic year (4 terms) or $260.00 for each occupant, or $65.00 each occupant per term.

Epworth Hall on the Woman's College Campus and Hanes House on the Duke University Campus are available to women enrolled in the Medical School. The rental charge for a single room in Epworth Hall is $340.00 for the academic year or $85.00 per term. The rental charge for a double room is $570.00 for the academic year (4 terms) or $285.00 for each occupant, or $71.25 each occupant per term. There are no single rooms for medical women in Hanes House. The rental charge for a double room in Hanes House is $590.00 for the academic year (4 terms) or $295.00 for each occupant, or $73.75 each occupant per term.

Duke University Apartments, which consist of efficiency, one-, and two-bedroom apartments, are available to married graduate students. The apartments are complete with basic furnishings, and the rental charges per month are $70.00 for the efficiency, $80.00 for the one-bedroom, and $90.00 for the two-bedroom. Heat, electricity except for window fans and air conditioners, hot and cold water, garbage and trash collection, and maintenance of grounds are all included in the rental charge. For further information on married student apartments, write to the Housing Bureau, Duke Station, Durham, North Carolina.

Regulations

Residence hall rooms and Duke University Apartments may be reserved by new applicants only if they have been accepted officially for admission to the School of Medicine. Applications for residence halls rooms are to be made to the Housing Bureau, Duke Station, Durham, North Carolina. A $25.00 room deposit is required of each applicant before a residence hall room reservation is made. The initial room deposit is effective in making room reservations for each term of continuous residence. In the event that a student moves out of the residence hall for as much as one term, the initial deposit may no longer be used to reserve a room, except when residence away from the residence hall is a normal part of the academic program approved by the Dean of the School of Medicine. The deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated provided written notice is received at the Housing Bureau requesting refund.

b. Upon withdrawal from Duke University residence halls by students enrolled on the semester basis, provided written notice is received in the Housing Bureau by August 1st for cancellation of a reservation for the fall semester, and not later than January 15th for cancellation of a reservation for the spring semester.

c. Upon withdrawal from Duke University residence halls by stu-

dents enrolled on the basis of the medical term, provided written notice is received in the Housing Bureau by August 1st for cancellation of a reservation for the term beginning in September, and not later than ten (10) days prior to the beginning of any subsequent medical term within the academic year.

d. When the reasons requiring withdrawal are beyond the student's control.

No refund will be made until the occupant has checked out of his room through the Housing Bureau and has settled his account with the Bursar.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of his reservation.

The authorities of the University do not assume responsibility for persons selected as roommates. Each student is urged to select his roommate when the room is reserved. Any student who occupies a double room without a roommate will be given written notice from the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room.

Any exchange of rooms must be made at the Housing Bureau. Persons who exchange rooms without the approval of the Housing Bureau will be subject to the charge for both rooms.

Rooms are rented for the academic year but for no period of less than one term without special arrangements. After the day of registration, no refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

Regulations governing the occupancy of rooms will be supplied by the Housing Bureau to those students who make application for housing. Occupants are expected to abide by these regulations.

The dining facilities in the Men's Graduate Center, Duke University Union, and the Woman's College Union are available to students of the Medical School. The cost for the academic year ranges from $450.00 upward, depending on the individual.

STUDENT MEDICAL CARE

With the exceptions noted below, full medical and surgical care is furnished to all regularly matriculated medical students of the University who have paid the quarterly General Fee. This service is under the direction of the Physician-in-Charge with the co-operation of the staff of the Duke University Medical Center. It includes hospitalization (limited to thirty days), medical and surgical care, drugs, dressings, x-ray studies, and ward but not special nursing. A charge for board

is made at the same rate as in the University dining halls. Refraction of eyes and treatment of teeth and of all chronic and pre-existing conditions, such as diseased tonsils, hernia, elective surgery, chronic skin conditions, endocrine disturbances, etc., or accidents or illnesses occurring during vacations or while off the campus are not included in this service. The cost of any necessary braces and orthopaedic appliances, as well as of special nursing must be borne by the patient. If the student has insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of his medical care.

Elbert L. Persons, M.D. (Harvard, 1927), *Physician-in-Charge and Professor of Medicine.*

Richard M. Portwood, M.D. (Southwestern, 1954), *Assistant to the Director and Associate in Medicine.*

MOTOR VEHICLE REGISTRATION

Each motor vehicle operated on the campuses by students enrolled in the School of Medicine must be registered at 05 Allen Building within 5 days after arrival, and thereafter must display the proper registration emblem. To register a vehicle, the student must present the following documents:

1. State vehicle registration.
2. State operator's license.
3. Evidence of automobile liability insurance as required by North Carolina law: $5,000 per person and $10,000 per accident for personal injuries; and $5,000 property damage.

Parking, Traffic, and Safety Regulations will be given each student who registers his vehicle. Students are expected to abide by these regulations.

ORGANIZATIONS

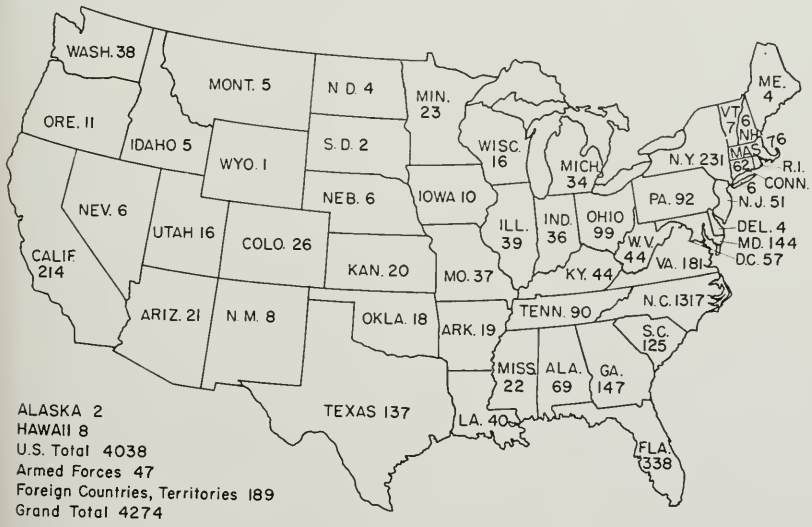
Duke University Medical Alumni

The Duke Medical Alumni now number over 4,200. Membership includes all graduates of the Medical School (total through 1964 was 2,250), past and present faculty, all past and present house-officers of Duke Hospital (including the 2,224 who are not Duke graduates); making a grand total of 4,274. Associate membership is held by alumni of the following Paramedical Services: Hospital Administration, Dietetics, Social Service, Laboratory Technique, X-Ray Technology, Physical and Occupational Therapy, Medical Record Library, and Medical Art and Illustration.

Officers

Dr. Joseph H. Hiatt '40, *President* (Southern Pines, N. C.).
Dr. William D. Farmer '30, *Vice President* (Greensboro, N. C.).
Dr. Talmage L. Peele '29, *Secretary* (Duke Medical Center).
Dr. George J. Baylin '36, *Treasurer* (Duke Medical Center).

A newsletter is sent to all the members in January, April, July, and October of each year. Reunions are held every year in Durham, the next is planned for 1966. Alumni groups have been formed in several states. Alumni luncheons or dinners are held during the following meetings: The American Medical Association, The Southern Medical Association, The North Carolina Medical Society, and the American Academy of Pediatrics. The map shows states in which Duke Medical Alumni are located and the number in each state. Figures include those who received the M.D. degree from Duke and also those who have served a year or more on the housestaff. Not shown are the 189 physicians serving in the territories of the U. S. and in foreign countries and 47 on duty in the Armed Forces overseas.* A total of 4038 physicians are distributed throughout the United States.



(figures based on statistics available August, 1964)

* Afghanistan, one; Australia, two; Belgium, three; Brazil, seven; Canada, twenty-eight; Chile, eight; China, one; Colombia, ten; Cuba, four; Denmark, one; Egypt, one; Formosa, nine; France, three; Germany, three; Greece, one; Guatemala, five; Iceland, three; India, five; Iran, three; Iraq, one; Ireland, one; Italy, one; Jamaica, B.W.I., one; Japan, eighteen; Jordan, two; Kenya, one; Korea, four; Lebanon, one; Malaya, one: Mexico, seven; Nigeria, one; Norway, two; Panama, four; Paraguay, one; Peru, two; Philippine Islands, six; Puerto Rico,

three; Rhodesia, one; Scotland, one; South Africa, two; Sweden, three; Switzerland, two; Thailand, six; United Kingdom, twenty-two; Venezuela, five; Virgin Islands, one.

Student Government Association

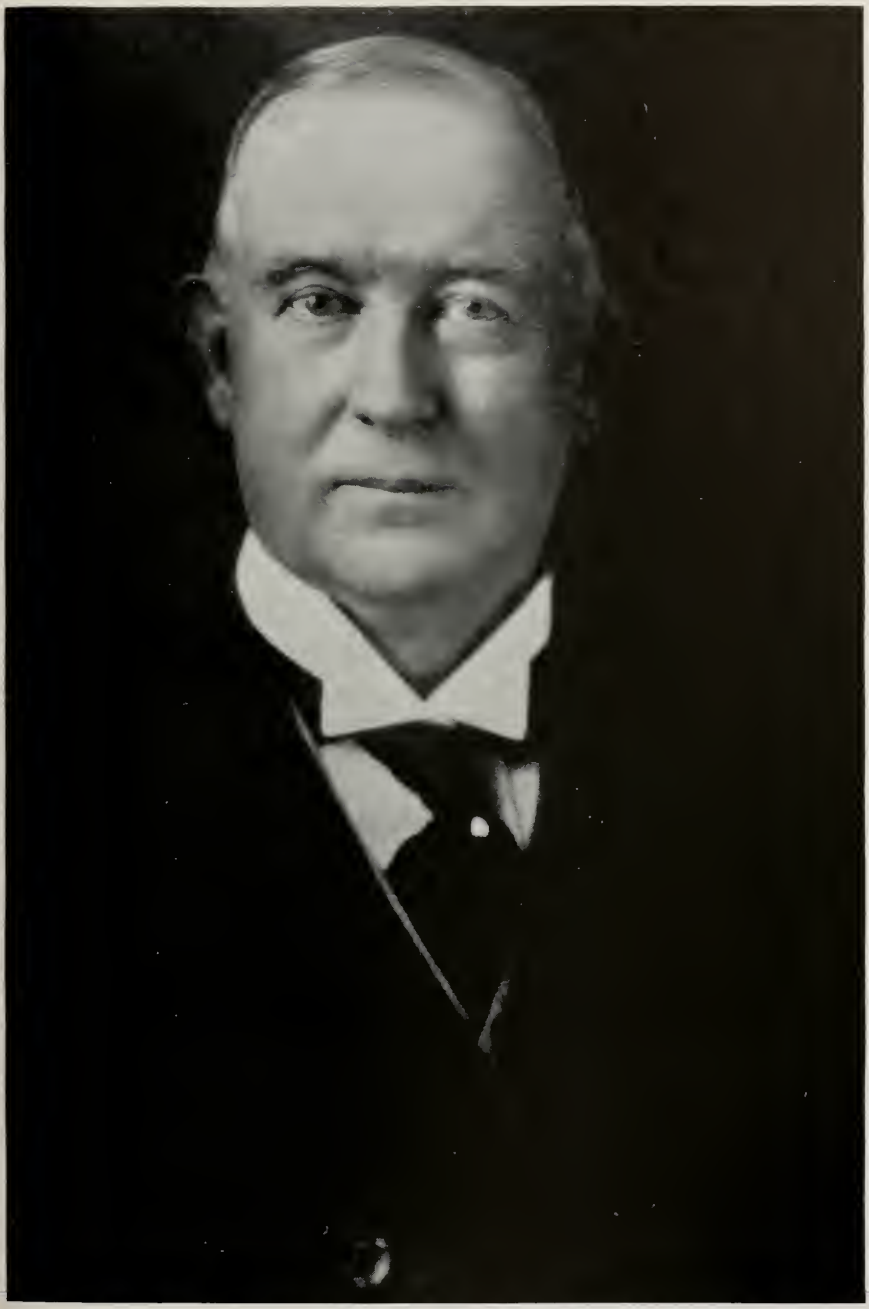
The Student Government Association is composed of 16 elected members of the student body: three officers, three representatives from each class, and the President of SAMA or his appointee. Responsibilities of the SGA include indoctrination of the freshman advisory council, publication of the school yearbook, participation in the Davison Scholar Program, and organization of social events.

A major responsibility of the SGA is the review of disciplinary matters brought to its attention through its role as the Honor Council. The development of character and thoughtful consideration of responsible action are enhanced by several measures during medical school, and one of these is the Honor System. A level of acceptable conduct exists in most fields of endeavor, but the level must be particularly high for the physician. At Duke, any person who fails in this respect must answer to the Honor Council and to the administration.

The Duke SAMA Chapter

Representing 75% of the medical student body, the Duke Chapter of the Student American Medical Association is a service organization interested in a wide spectrum of activities. SAMA is a national organization which represents the opinions and desires of the future physicians of America.

Chartered only recently, the organization has earned a reputation for its interest in medical recruitment in conjunction with the admissions committee, a summer externship program, a directory of the medical center, a listing of research opportunities for medical students and many other service projects. The Duke Chapter has been very active in the national organization.



"I request that great care and discrimination be exercised in admitting as students only those whose previous record shows a character, determination and application evincing a wholesome and real ambition for life."—James B. Duke.

Admission

Intelligence, character and integrity are the essential qualifications for admission.

A premedical student should be aware of the importance of a well-rounded general education as a preparation for the study of medicine and not limit himself to scientific courses. The Admissions Committee believes that the manner in which the college years are utilized is of greater importance than the specific subjects taken. The premedical student would be better advised to secure a knowledge of the principles and a thorough appreciation of the interrelations of the basic sciences than to accumulate credits in many courses. He should learn how to work independently, to observe critically and to analyze rather than merely to store the information presented. Good study habits and use of time are perhaps the most important tools a student can bring to the study of medicine. His choice of studies beyond those required for admission should be governed by his own chief interests and by the intellectual stimulus to be derived from the work.

APPLICATION FOR ADMISSION

Application forms may be obtained by writing to the Director of Admissions, Box 3710, Duke Hospital, Durham, N. C. Please do not send a request before August 1. Formal applications will be accepted by the Committee on Admissions only between 1 August and 1 December.

Due to the large number of qualified applicants to all medical schools, each student is urged to apply to at least four schools.

REQUIREMENTS FOR ADMISSION

1. A minimum of ninety semester hours of approved college credit is necessary for admission to the School of Medicine. These must include:

A. Two years of English. The second year should be chiefly expository English composition.
B. Two years of chemistry. The first year should be inorganic and the second analytic and organic.
C. One year of physics.
D. One year of biology and/or zoology.
E. One year of mathematics.

Strongly recommended courses but not absolutely required:

F. Embryology.
G. Calculus.
H. Genetics.

All science requirements must be completed not more than seven years prior to entrance.

2. Medical College Admission Test. This test is required of all applicants. It is administered by the Psychological Corporation, 304 E. 45th St., New York 17, New York. This test is given at many of the colleges throughout the country in May and October of each year. Arrangements for taking this test should be made by the student through his premedical advisor.

SELECTION

Selection is made between September 15 and February 15 for the student entering the following September. The data on each candidate are carefully screened by the Committee on Admissions. A personal interview will be arranged for those with satisfactory credentials. If the distance from Durham is permissible the interview is conducted here; otherwise the candidates are referred to our regional representatives. Many factors are evaluated by the Committee in the selection process. Those students who show the most promise for exceptional performance in their future practice of medicine are admitted. The candidate is notified as soon as possible whether or not he has been accepted. If he has been accepted it is necessary to send a deposit of $50.00 by the succeeding January 15 in order to insure enrollment. This deposit is applied toward tuition and is refundable upon withdrawal prior to January 15. Inasmuch as admission must be offered a considerable period in advance of matriculation the admission must be provisional upon the successful completion of the remaining college work. In addition, a physical examination is necessary prior to enrollment.

TRANSCRIPTS

A student who wishes to transfer his credits to another institution should direct his request to the Recorder, Duke University School of Medicine. Transcripts are furnished without charge.

ADVANCED STANDING

Applications for transfer into the second and third year classes will be considered only if space permits. No application for entrance to the fourth year will be considered. For entrance into the third year, Part I of the National Board Examination will be required as evidence of satisfactory accomplishment in the subjects of the first two years.

A limited number of transfer students from foreign medical schools may be admitted each year. Such students will be admitted into the third-year class in January only. A faculty committee will plan the program for each student on the basis of his needs and interests. By attending two summer sessions, a transfer from a foreign medical school can receive his M.D. degree from Duke University approximately two and one-half years after matriculation.

REGIONAL REPRESENTATIVES OF THE COMMITTEE ON ADMISSIONS

Alabama: *Birmingham,* Sam E. Upchurch

Arizona: *Phoenix,* Stanley Karansky

Arkansas: *Little Rock,* Rosalind Smith Abernathy

California: *Berkeley,* H. I. Harvey; *Los Angeles,* Joseph A. Conroy, Jeremiah W. Kerner; *Menlo Park,* Gustave Freeman; *Palo Alto,* James B. Golden; *Pasadena,* Robert H. Pudenz; *San Francisco,* John E. Cann; *San Mateo,* Lester H. Margolis

Canada: *Montreal,* J. E. Gibbons; *Toronto,* John B. Armstrong

Colorado: *Denver,* F. Vernon Altvater

Connecticut: *Hartford,* William H. Glass; *New Haven,* Clarence Davis, Saul A. Frankel, Joseph Mignone, Ned M. Shutkin; *Old Saybrook,* John R. Egan

District of Columbia, Louis Spekter

Florida: *Gainesville,* Lamar Roberts; *Lakeland,* Charles Larsen, Jr.; *Miami,* James J. Hutson; *St. Petersburg,* David S. Hubbell; *Tampa,* Richard G. Connar

Georgia: *Atlanta,* E. B. Dunlap, Jr.

Hawaii: *Honolulu,* James G. Harrison, Jr.

Idaho: *Boise,* William L. Venning; *Idaho Falls,* Reid H. Anderson

Illinois: *Chicago,* George H. Gardner, Daniel J. Pachman, E. Clinton Texter, Jr.; *Evanston,* Donald R. Mundie, Kenneth S. Shepard, Milton Weinberg, Jr.; *Monmouth,* Kenneth E. Ambrose

Indiana: *Indianapolis,* Stuart O. Bondurant

Iowa: *Iowa City,* Arthur L. Benton

Kansas: *Kansas City,* Ralph H. Major; *Wichita,* Thomas Jager

Kentucky: *Lexington,* Kearns R. Thompson; *Louisville,* George Uhde

Louisiana: *New Orleans,* Richard H. Corales, Jr., Harold M. Horack, Philip H. Jones, Richard M. Paddison

Maine: *Portland,* E. Charles Kunkle

Maryland: *Baltimore,* John T. King, C. Edward Leach

Massachusetts: *Boston,* James H. Currens, Dorothy A. Elias, Ellison C. Pierce, Jr., R. Lewis Wright; *Brookline,* James L. Tullis; *Milton,* Raymond D. Adams; *Springfield,* George A. Sotirion

Michigan: *Ann Arbor,* Muriel Meyers; *Port Huron,* William T. Davison

Minnesota: *Rochester,* W. Henry Hollinshead

Missouri: *Kansas City,* Robert H. Barnes

New Hampshire: *Hanover,* George Margolis, Robert J. Vanderline

New Jersey: *Montclair,* Benjamin B. Burrill

New Mexico: *Albuquerque,* Robert Proper; *Artesia,* C. Pardue Bunch

New York: *Endicott,* James K. Tompkins; *New York City,* Eugene L. Horger, Julia M. Jones, Michael J. Lepore, J. William Littler, Richard A. Ruskin, Joseph A. C. Wadsworth; *Rochester,* Ashton B. Morrison

Ohio: *Columbus,* Robert J. Atwell, Charles A. Doan, James V. Warren; *Dayton,* Stuart R. Ducker; *Toledo,* John L. Stifel

Oklahoma: *Tulsa,* Gerald E. Cronk

Oregon: *Portland,* Richard R. Carter

Pennsylvania: *Bethlehem,* Ralph K. Shields, James G. Whildin; *Bryn Mawr,* John V. Blady; *Johnstown,* W. Frederick Mayer; *Philadelphia,* Max W. Fischbach, Karl C. Jonas, Alfred M. Sellers; *Pittsburgh,* Jack D. Myers

Puerto Rico: *Santurce,* Kenneth B. Brown

Rhode Island: *Providence,* Marshall N. Fulton

South Carolina: *Charleston,* Edward F. Parker, J. I. Waring; *Columbia,* Ben N. Miller; *Greenville,* Raymond C. Ramage

Tennessee: *Chattanooga,* Richard Van Fletcher; *Memphis,* Raphael E. Semmes; *Nashville,* A. Greer Ricketson; *Sewanee,* Henry T. Kirby-Smith

Texas: *Dallas,* A. James Gill; *Galveston,* Henry L. Burks, R. H. Rigdon; *Houston,* H. Grant Taylor; *Midland,* Dorothy B. Wyvell; *San Antonio,* Royall M. Calder

Utah: *Salt Lake City,* Thomas Ray Broadbent

Vermont: *Burlington,* Rufus C. Morrow

Virginia: *Charlottesville,* Henry B. Mulholland

Washington: *Seattle,* W. A. MacColl

West Virginia: *Charleston,* Harold H. Kuhn; *Huntington,* George M. Lyon

Wisconsin: *Madison,* O. A. Mortensen

SUMMARY FOR APPLICANTS

Years of College work required	3
Tuition and fees for first year	$1412.00
Estimated cost of equipment first year	$ 265.00
Estimated room and board	$ 860.00
Non-refundable application fee	$ 10.00
Deposit required on or before January 15, 1966 from accepted applicant	$ 50.00
Medical College Admission Test required	Yes
Size of 1965-66 first year class	80
File application for admission between	August 1, 1965 December 1, 1965
Notification of action on application between	October 1, 1965 February 15, 1966
Date entering class starts school	September 6, 1966

Financial Information

FEES AND EXPENSES

Listed below is a table of the approximate expenses for the normal four term academic year of the School of Medicine:

Tuition and fees	$1412.00
Board	600.00
Room	260.00
Books	135.00
Laundry	100.00
Insurance, instruments and incidentals*	160.00
	$2667.00

One fourth of the total fees is payable by the Friday preceding each nine-week term. A fine of $5.00 is charged for late registration after this time. No credit will be given for any term in which the tuition has not been paid, whether the work has been done here or elsewhere.

It is not advisable for students to attempt outside work to defray their expenses during the academic year.†

AVAILABILITY OF FINANCIAL ASSISTANCE FOR MEDICAL EDUCATION

With the increasing cost of medical education, the need has also increased for financial assistance to deserving students. Three kinds of aid are currently available: scholarships or fellowships; loans; and cash awards. Where not stated, information concerning these may be secured from the Office of the Dean.

SCHOLARSHIPS—FELLOWSHIPS

THE CHARLES ALVA STRICKLAND MEMORIAL FUND SCHOLARSHIPS may cover up to full tuition costs. This scholarship may be renewed for each of the years after the first year. Merit and need are taken into consideration.

THE DR. HILLORY M. WILDER SCHOLARSHIP FUND covers full tuition for each of four years and is awarded on the basis of merit and need.

* Microscope, sphygmomanometer, ophthalmoscope, otoscope, and other equipment, which are required of each student and which must conform to rigid standards, may be obtained at the University through a special payment program.

† Wives of medical students desiring employment may secure information from the Duke Medical Center Personnel Office or the Duke University Personnel Office.

THE DUKE MEDICAL SCHOOL ALUMNI SCHOLARSHIPS are awarded to outstanding students, irrespective of financial need. These honorary scholarships carry an annual stipend of $500.00 per year for each of four years.

THE PFIZER Scholarship, offered by Pfizer Laboratories, A Division of Charles Pfizer & Co. Inc., is an award of $1,000 granted to a student selected on the basis of merit and need.

THE MANOOCHERIAN-ROBBINS FOUNDATION SCHOLARSHIP of $500.00 for one year is granted to one outstanding student each year. This award is made as a supplement to a student who has already been awarded some other scholarship aid.

STUDENT RESEARCH FELLOWSHIPS are available as part of an extensive program designed to encourage the medical student to participate in research. Summer Fellowships carry a stipend of $200.00 per month. These Fellowships enable selected students, after completion of their first year, to participate in research during a summer vacation or other free time. Special Fellowships in Nutrition, Ophthalmology, Allergy, and other fields are also available. Opportunities also exist for a student to engage in research for an entire year during which time he temporarily discontinues his medical course. These Post-Sophomore Research Fellowships carry a stipend of $3200 per year plus an allowance for dependents and tuition expenses. In special circumstances these Fellowships are tenable at institutions other than Duke Medical Center and outside the United States. Information may be obtained from the Assistant Dean for Medical Student Affairs.

THE WILBURT C. DAVISON SCHOLARSHIP was instituted to enable a medical student to widen his experience by clinical study outside of the United States. One award of $500.00 is made each year. Information may be obtained from the Assistant Dean for Medical Student Affairs.

LOANS

Loan funds are administered in accordance with the following regulations:

1. Loans will be made only to students who are taking full courses of study that lead to a degree. All loans except the Swett Fund must be arranged not later than July 1 of each year.
2. Every applicant for a loan must present with the application such security as the President of the University may approve, and no money will be advanced before a note with approved security is in the hands of the Treasurer of the University.

THE ANGIER B. DUKE MEMORIAL FUND covers amounts up to full tuition for each of four years.

THE W. K. KELLOGG FOUNDATION FUNDS are available for amounts up to full tuition for each of four years.

THE FRANCIS AND ELIZABETH SWETT FUNDS are immediately available to students with emergency need. These loans are usually small, on a short-term basis.

THE JAMES L. CLARK MEMORIAL FUND provides financial aid to needy students who are outstanding in merit and dedication.

NORTH CAROLINA STATE LOANS are available to worthy students who agree to practice in a North Carolina rural area or small town of less than 2500 population for at least four years after the completion of their professional training. To be eligible a student must have been a resident of North Carolina for the past eight years. The maximum loan to a medical student is $1,400.00 per academic year ($5,600.00 for a four year period). The student who receives a loan must, immediately following completion of the four year medical course, take a rotating internship of one year and if approved by the Medical Care Commission, he will have the option of continuing the internship through a second year. Detailed information can be obtained from the North Carolina Medical Care Commission, Post Office Box 1880, Raleigh, North Carolina.

HEALTH PROFESSIONS STUDENT LOAN FUND was created by federal legislation and funds have been allotted to Duke University School of Medicine. Long term loans are made at favorable interest rates. Detailed information may be obtained from the Program Representative, Dr. Joseph E. Markee.

CASH AWARDS

THE BORDEN UNDERGRADUATE RESEARCH AWARD IN MEDICINE is an award of $500.00 to be given to the Duke senior who, on the recommendation of the Award Committee, has performed the best research work during his or her entire medical course, including that done during the preclinical years. Applicants should submit their papers, articles or reprints to the Dean at least three months prior to expected date of graduation.

THE TRENT PRIZE IN THE HISTORY OF MEDICINE was established by Mrs. Mary Trent Semans in memory of the late Dr. Josiah C. Trent, to encourage students to undertake independent work in the history of medicine and to utilize the resources of the Trent Collection.

An annual award of $100.00 is offered for the best essay by a Duke medical student on any topic in the history of medical and allied sciences. An additional book award will be made to each entry of merit. Students are invited to discuss possible topics with the Curators of the

Trent Collection. Finished papers must be submitted to Mr. G. S. T. Cavanagh, Medical Center Library, by October 31 of each year.

THE ROBERT U. YOUNG AWARD was established by friends and classmates of the late Robert U. Young (M.D. '51). An outstanding second year student, selected by the Dean, receives all of the basic equipment needed except for the microscope.

Curriculum

In recent years, analysis and appraisal of the curriculum in medical schools has caused changes in many. Several factors have required these changes, important among them being the increasing scope and complexity of medicine generally, and the dissatisfaction with the sharp cleavage between basic science and clinical years. As a result of long study, the Duke University School of Medicine will have a major revision of the curriculum which will begin with class starting in the Fall of 1966.

The aims of the new curriculum are: (1) to provide a strong academic basis for a lifetime of growth within the profession of medicine, with the development of technical competency, proficiency, and the proper attitudes peculiar to the practice of medicine as well as appreciation of the broader social and service responsibilities; (2) to establish for the first year a basic science program which will fulfil the purposes of the increasingly heterogenous student body; (3) to offer both clinical and basic science education simultaneously; (4) to permit the student to explore his personal intellectual preferences and capabilities; (5) to allow study in depth in selected areas, either clinical or basic science; (6) to provide greater freedom of course selection and thus to encourage earlier career decision; (7) to achieve better integration of the medical school curriculum with residency training and the practice of medicine.

FIRST YEAR

The student will study the basic principles of all the preclinical disciplines. Rather than mastering an encyclopedic array of facts, the purpose will be to acquire familiarity with the major principles of each subject. As an introduction to medicine, physical diagnosis and clinical microscopy will be presented by the clinical services. The year will be divided into two terms, each of eighteen weeks, as follows:

Term 1	*Hours*
Anatomy	252
Biochemistry	205
Physiology	205
Genetics	36
Psychobiology	11
Free Time (Study, etc.)	92
	801

Term II	
Pathology	235
Microbiology	168
Pharmacology	139
Psychobiology	49
Physical Diagnosis	54
Clinical Microscopy	54
Preventive Medicine	35
Free Time (Study, etc.)	67
	801

SECOND YEAR

The second year will provide an extensive exposure to all of the major clinical disciplines permitting the student early in his career to become a participant in the care of patients. The acquired appreciation of the problems of the clinical areas and the opportunities to recognize the applications of the basic sciences should lead to a more meaningful selection of courses for the subsequent two years. The second year will be divided into five terms of seven weeks each as follows:

Medicine	7 weeks
Obstetrics	7 weeks
Pediatrics	7 weeks
Psychiatry	7 weeks
Surgery	7 weeks

THIRD AND FOURTH YEARS

These two years will be made up of elective courses, as flexible as possible within requisite limitations. Each student will have two advisors, one from the preclinical and one from the clinical faculty. These advisors, with the Office of the Dean, will assist the student in formulating his program for the third and fourth years. Maximum and minimum course load requirements will be established. Approximately one-half the time will be spent in basic science and one-half in clinical science. The student will be advised to spend substantial time in medicine and surgery. Completion of the Medical Research Training Program may fulfil the requirements for basic science.

The elective courses of study offered are described under each department. The combinations are too varied to be enumerated. The wide selection, however, affords an opportunity for each student to design his program to satisfy best his needs in conformity with his medical future.

As an alternative after completion of the second year, the student may enroll as a Ph.D. candidate in one of the basic sciences, earning this degree in two or three years. Then, having completed three of the four years necessary for an M.D., he may earn the M.D. degree by completing a fourth clinical year.

The third and fourth years will be divided into four quarters of nine weeks each. Certain courses as noted will be offered during the summer term.

PROMOTION

The records of each student in the first and second years are reviewed periodically by special Promotion Committees, which are made up of the preclinical Department Chairman. The Medical School Advisory Committee acts on recommendations from these Promotion Committees and may:

1. Promote to the next year those students whose work is good.
2. Warn those students whose work is below average that they must improve their scholastic endeavor.
3. Place on probation those students whose work is not good.
4. Request the resignation of any student who is considered an unpromising candidate for the degree of Doctor of Medicine.

A student wishing to appeal this decision may do so to the Chairman of the Committee on Health Affairs within two weeks of his notification.

The Medical School Advisory Committee reserves the right to require the withdrawal of any student at any time if, in the opinion of the majority of its members, he should not continue his course.

At the end of the second year each student will be required to take and pass Part I of the National Board Examinations.

DEGREES

DOCTOR OF MEDICINE. The degree of Doctor of Medicine is conferred on those students who have completed the curriculum of the School of Medicine to the satisfaction of the Medical School Advisory Committee.

BACHELOR OF SCIENCE IN MEDICINE. The degree of Bachelor of Science in Medicine is conferred upon those students who have fulfilled the following requirements: 1) Completed two academic years at the Duke University School of Medicine with performance in all courses at the level of "Good" or better, 2) Obtained approval of a research program to be conducted under the sponsorship of a faculty member and with the consent of the head of the department in which the work is to be done, 3) Obtained written permission from the Dean's Office, 4) Completed creditable, original investigative work under the supervision of an advisory committee of which the faculty sponsor will be chairman and appointed by the chairman of the appropriate department, 5) Completed a written report in the form of a thesis meeting the

requirements of the Graduate School of Arts and Sciences and which has been accepted by the advisory committee following an oral examination, 6) Submitted one bound copy and two unbound copies to the Dean of the School of Medicine at least two months prior to the expected date of graduation.

No credit toward this degree is given for additional college work. All students in good standing are encouraged to undertake work towards this degree in addition to their work toward the degree of Doctor of Medicine. Application should be made to the Assistant Dean for Medical Student Affairs for guidance in establishing the program and for aid in fulfilling these requirements.

Departments of Instruction

ANATOMY

Joseph E. Markee, Ph.D. (Chicago, 1929), *James B. Duke Professor of Anatomy, Chairman of the Department, and Assistant Dean in Charge of Admissions.*

John W. Everett, Ph.D. (Yale, 1932), *Professor of Anatomy.*

Talmage L. Peele, M.D. (Duke, 1934), *Professor of Anatomy, Associate Professor of Neurology and Assistant Professor of Pediatrics.*

R. Frederick Becker, Ph.D. (Northwestern, 1940), *Associate Professor of Anatomy.*

John Buettner-Janusch, Ph.D. (Michigan, 1957), *Associate Professor of Anatomy and Associate Professor of Zoology.*

W. Kenneth Cuyler, Ph.D. (Duke, 1941), *Associate Professor of Cytology and Anatomy.*

Kenneth L. Duke, Ph.D. (Duke, 1940), *Associate Professor of Anatomy.*

Montrose J. Moses, Ph.D. (Columbia, 1949), *Associate Professor of Anatomy.*

Frederick D. McFalls, M.D. (Duke, 1949), *Assistant Professor of Anatomy.*

John A. Goree, M.D. (Duke, 1955), *Associate in Anatomy and Assistant Professor of Radiology.*

Hertha R. Cress, Ph.D. (Duke, 1957), *Associate in Anatomy.*

Frank H. Bassett, III, M.D. (Louisville, 1957), *Associate in Anatomy and Assistant Professor of Orthopaedic Surgery.*

James Walter Wilson, Ph.D. (Kentucky, 1965), *Instructor in Anatomy.*

Mary Alice Rundles, A.B. (DePauw, 1935), *Instructor in Anatomy.*

The core course of instruction in human anatomy will constitute about 252 hours during the first 18 weeks of the first year. The gross anatomy of the head, neck and trunk will be studied during the first 14 weeks, histology during the first 9 weeks, neuroanatomy during the 10th to 18th weeks. The gross anatomy of the back, pectoral and pelvic girdles and the limbs will be studied during the 15th to 18th weeks. All of the above will be integrated with the other material studied during the first year. Emphasis will be placed upon the study of the material in the laboratory. In an attempt to utilize more fully the laboratory time, audio-visual education methods will be employed as fully as possible. These techniques will consist of color motion pictures of demonstration dissections, closed-circuit television, color lantern slides, and motion pictures, both embryologic and neurologic. All of the instruction is designed to be as informal and as nearly individual as possible. General principles and the functional viewpoint of living anatomy will be stressed in the hope that the student may be stimulated to secure a working knowledge of anatomy in the broadest sense. Whenever possible, fresh tissues and living cells will be made available for examination. Patients exemplifying anatomical principles will be presented, some within the classroom, others over live television,

and others pre-recorded on videotape for later presentation at the appropriate time in the students' learning experience. Through the cooperation of the Department of Radiology, the students will be given an opportunity to study portions of the living human body as revealed by the fluoroscope and roentgenograph.

In gross anatomy all of the students will dissect the important structures in certain areas of the body; namely, within the neck, thorax, abdomen and pelvis. In other regions the students will do little or no dissection but will instead view prosections as well as pre-recorded TV programs and motion pictures. The regions that will be presented in this manner include the back, the pectoral and pelvic girdle, the limbs, the interior of the cranium, including the gross anatomy of the ear and orbit and the oral and nasal passages and the paranasal sinuses. The general principles of programmed learning will be utilized even more extensively than in the past few years.

In microscopic anatomy the students will be introduced to electron-microscopy and the teaching will be focused on the cell, its generalized structural and functional organization and its differentiation in various organs and tissues. The students will be introduced to biochemical cytology and to biophysical cytology and cytological genetics.

In neuroanatomy the students will be introduced to neurocytology and nerve cells and glia. The major part of the course will deal with; a) the spinal cord, including the ascending and descending and associative tracts, b) the brain and brain stem and cranial nerves 3 through 12, c) the autonomic nervous system, d) the cerebellum and brain stem and reticular formation, e) the thalamus and hypothalamus, f) the cerebral cortex, including its structure and blood supply and primary pathways, g) the somatic sensory and the motor systems, as well as the visual and auditory and olfactory and limbic systems. There will also be clinical neurology presentations of suitable patients.

The students will spend about 92 hours in gross anatomy, about 80 hours in microscopic anatomy and about 80 hours in neuroanatomy.

Gross Anatomy

Courses in Anatomy Offered During the Third or Fourth Years.

Anatomy as Related to Locomotion. Complete dissection of that part of the body concerned with locomotion and posture; namely, the back, the pectoral and pelvic girdles and the superior and inferior extremities. Visual aids of all kinds will be used extensively, including motion pictures, pre-recorded TV presentations and lantern slides. This course will be designed to meet some of the needs of Ph.D. candidates in anatomy, as well as students interested in general practice, orthopaedics or neurosurgery. Prerequisites: either the core course in anatomy or anatomy 205 which may be taken concurrently. 4 units of

graduate credit. (18 lecture hours and 171 hours of laboratory work, from February to June.) Drs. Markee, Everett, Becker, Duke and Bassett. (This course is currently listed in the bulletin of the Graduate School as M201.)

Anatomy of the Viscera. This is a study of the anatomy of the thoracic, abdominal and pelvic organs. Emphasis will be primarily upon the anatomy of these viscera and their blood supply, and innervations and relationships. This is primarily a laboratory course, but the dissections will be augmented by extensive use of prosections, motion pictures and pre-recorded TV presentations. This course is designed for Ph.D. candidates in anatomy as well as for future general practitioners and specialists in internal medicine. Prerequisite: core course in anatomy. 2 units of graduate credit (18 lecture hours and 72 hours of dissection from February to June). Drs. Markee, Everett, Becker and Duke. (This course is listed in the Graduate School Bulletin as M205.)

Anatomy of the Interior of the Cranium and Deep Face. This course will deal with: a) the interior of the cranium and the ear, eye and orbital contents, b) deeper structures of the head, including the brain and its blood supply and venous drainage, c) deeper structures of the head, including the nasal and oral cavities as they are related to the pharynx, and d) paranasal sinuses. This course is designed to meet the needs of the Ph.D. candidates in anatomy as well as the needs of general practitioners and the specialists including neurosurgeons, clinical neurologists and specialists in ear, eye, nose and throat. The major emphasis will be on gross dissections. Visual aids of all types will be utilized extensively, including a unique collection of lantern slides acquired during the last 15 years, as well as pre-recorded TV presentations acquired more recently. Prerequisites: the core course in anatomy or the equivalent. 2 hours graduate credit (18 hours of lectures and 72 hours of dissection from February to June). Drs. Markee, Everett, Duke, and McFalls.

Special Dissection of a Restricted Region. This course is designed for any group of students with a special interest. For example, the heart and its anatomical characteristics and relationships or in some other region. This course will be planned for the individual needs of the group of students requesting the course. Prerequisites: Core course in anatomy. Units of credit may vary from 1 to 3. Conference hours should total about 18 and laboratory hours totaling 36 to 72. Drs. Markee, Everett, Duke, and Bassett. (This course is currently listed as M312.)

Neuroanatomy

Laboratory Work and Special Neuroanatomy. This course will involve laboratory work and conferences on special areas of the

human central nervous system. One course will be available per year and will be made available to the 5 to 10 students who can agree upon a single discrete area of this advanced instruction in neuroanatomy. The areas of choice will be the following: a) the brain and brain stem and cranial nerves 3 through 12, b) the autonomic nervous system, c) the cerebellum and brain stem and reticular formation, d) the thalamus and hypothalamus, e) the cerebral cortex, including its structure and blood supply and primary pathways, and f) the somatic sensory and the motor systems, as well as the visual and auditory and olfactory and limbic systems.

This course will be designed for graduate students and for medical students who intend to specialize in neurosurgery or clinical neurology, or in ear, eye and throat with a special concern in the nervous system. This course would also be suitable for those few psychiatrists who have a real interest in certain parts of the central nervous system. 2 units of graduate credit (18 conference hours and 144 laboratory hours from February to June). Dr. Peele.

Neuroendocrinology-Histophysiology of Neuroendocrine Mechanisms. This course will consist of conferences and demonstrations and the opportunity for each student to participate in restricted but definitive laboratory experience. This opportunity must be restricted to 10 students who can agree to confine their laboratory work and the conferences to a reasonable number of the subject matters listed below: a) the hypophysis and its relation to the brain: Neurohypophysis; Microanatomy of the median eminence, etc; Neurosecretion; The chemotransmitter hypothesis, with special emphasis on the experimental basis; Pituitary cytology, b) control of adrenocortical secretions, c) control of the thyroid, d) histophysiology of the reproductive tract. Sex cycles, e) control of the day-to-day secretion of gonadotrophins, f) control of ovulation and corpus luteum function, g) control of prolactin secretion. Lactation, and h) neuroendocrine factors in sex differentiation, puberty and senility. Prerequisites: Core course of first year or equivalent. 3 units of graduate credit. (18 hours of conferences and 72 hours of laboratory work.) Drs. Markee, Everett, Peele and Duke.

Microscopic Anatomy

General Microscopic Anatomy. This course will deal with biology of cells in tissue culture. It will deal with those areas in cytology that can best be approached by means of tissue culture combined with time-lapse motion picture photography. Examples are: a) the study of cilia and photographic recording of changes in their movement after alteration in the media; b) changes in the cell membrane including the motion picture recording of the passage of substances through the membrane. Prerequisite: The core course in anatomy or its equivalent. 3



units of graduate credit. (18 hours of conferences and 72 hours of laboratory work) February to June. Drs. Moses, Becker, and Cress.

Cytological Genetics. This course will deal with the organization and functions of chromosomes, nuclei, cytoplasmic genetic structures, protein synthesis and DNA and RNA. Prerequisite: The core course or equivalent. 3 units of graduate credit (18 hours conference and 72 hours of laboratory work) February to June. Dr. Moses.

Biochemical Cytology. This course would deal with microscopical and functional cytochemistry and with correlation of structure with biochemical function. Prerequisite: Core course in anatomy. 3 units of graduate credit. (18 conference hours and 72 hours of laboratory work.) February to June. Dr. Moses.

Biophysical Cytology. The emphasis will be placed on the relation of large molecules to the structural and functional organization of cells; e.g. mitoses, patterns of DNA organization in cells, contractile protein membranes, etc. Prerequisite: Core course in anatomy. 3 units of graduate credit. February to June. Drs. Everett and Duke.

Neurocytology. This course will deal primarily with the neurosecretory process, impulse transmission and with memory. Prerequisite: Core course in anatomy. 4 units of graduate credit. (36 hours of conference and 72 hours of laboratory work.) Drs. Peele, Markee and Duke.

Physical Anthropology. A survey of the major developments of physical anthropology. Human evolution, primate phylogeny, paleontology of man and other primates, primate biochemical genetics, primate behavior, human variation (genetics and somatic) are the principal topics of the course. Prerequisites: core course in anatomy. 3 units of graduate credit. (18 lecture hours and 72 hours of laboratory work.) February to June. Dr. Buettner-Janusch. (This course is currently listed in the bulletin of the Graduate School as Anat. M231 and also as Soc. 231.)

BIOCHEMISTRY

Philip Handler, Ph.D. (Illinois, 1939), *James B. Duke Professor of Biochemistry and Chairman of the Department.*

Charles Tanford, Ph.D. (Princeton, 1947), *Professor of Physical Biochemistry.*

Mary L. C. Bernheim, Ph.D. (Cambridge, 1928), *Associate Professor of Biochemistry.*

William L. Byrne, Ph.D. (Wisconsin, 1953), *Associate Professor of Biochemistry.*

Eugene A. Davidson, Ph.D. (Columbia, 1955), *Associate Professor of Biochemistry.*

Walter R. Guild, Ph.D. (Yale, 1951), *Associate Professor of Biophysics.*

Jerome S. Harris, M.D. (Harvard, 1933), *Associate Professor of Biochemistry and Professor of Pediatrics.*

Robert L. Hill, Ph.D. (Kansas, 1954), *Associate Professor of Biochemistry.*

Henry Kamin, Ph.D. (Duke, 1948), *Associate Professor of Biochemistry and Principal Scientist at the Durham V.A. Hospital.*

William S. Lynn, M.D. (Columbia, 1946), *Associate Professor of Biochemistry and Medicine.*

Kenneth S. McCarty, Ph.D. (Columbia, 1957), *Associate Professor of Biochemistry.*

Ralph E. Thiers, Ph.D. (Toronto, 1947), *Associate Professor of Biochemistry and Director of the Clinical Chemistry Laboratory.*

Salih J. Wakil, Ph.D. (Washington, 1952), *Associate Professor of Biochemistry.*

James B. Wyngaarden, M.D. (Michigan, 1948), *Associate Professor of Biochemistry and Professor of Medicine.*

Irwin Fridovich, Ph.D. (Duke, 1955), *Assistant Professor of Biochemistry, U.S.P.H.S. Senior Fellow.*

Ronald C. Greene, Ph.D. (California Inst. of Tech., 1954), *Assistant Professor of Biochemistry and Biochemist, Durham V.A. Hospital.*

Norman Kirshner, Ph.D. (Pennsylvania State, 1952), *Assistant Professor of Biochemistry and Experimental Surgery, U.S.P.H.S. Senior Research Fellow.*

Harvey J. Sage, Ph.D. (Yale, 1958), *Assistant Professor in Pathology and Assistant Professor in Biochemistry.*

Robert W. Wheat, Ph.D. (Washington Univ., 1955), *Assistant Professor of Biochemistry.*

Theodore Rosett, Ph.D. (London, 1955), *Associate in Biochemistry.*

Eric Marler, M.D. (McGill, 1948), *Associate in Biochemistry and Medicine.*

Yasuhiko Nozaki, Ph.D. (Tokyo, 1945), *Research Associate in Biochemistry.*

K. V. Rajagopalan, Ph.D. (Madras, 1957), *Research Associate in Biochemistry.*

Leo B. Daniels, *Technical Associate in Biochemistry.*

Fellows

Victor Aleman-Aleman, M.D. (Universidad Nacional, Autonoma de Mexico, 1957), *Post-Doctoral Fellow in Biochemistry.*

Minoo H. Bilimoria, Ph.D. (Indian Institute of Science, 1962), *Post-Doctoral Fellow in Biochemistry.*

Klaus Brendel, Dr.Sci. (Free University, Berlin, 1962), *Post-Doctoral Fellow in Biochemistry.*

Bernard Bulos, Ph.D. (Duke, 1964), *Post-Doctoral Fellow in Biochemistry.*

Robert Delaney, Ph.D. (Albany Med. Coll. of Union University, 1962), *N.I.H. Special Post-Doctoral Fellow.*

Carlos del Río, Ph.D. (Cornell, 1953), *Post-Doctoral Fellow in Biochemistry.*

Robert E. Fellows, M.D. (McGill, 1959), *N.I.H. Post-Doctoral Fellow.*

Alicia Gutman, M.D. (Hebrew Univ., 1958), *Post-Doctoral Fellow in Biochemistry.*

E. P. Kirby Hade, Ph.D. (University of Chicago, 1962), *Post-Doctoral Fellow in Biochemistry.*

Takashi Hashimoto, M.D., Ph.D. (Gunma Univ., Univ. Tokyo, 1958), 1962), *Post-Doctoral Fellow in Biochemistry.*

Jacqueline Hijmans, M.D. (Leyden State Univ., Netherlands, 1949), *Post-Doctoral Fellow in Biochemistry.*

Louis Kanarek, Ph.D. (Brussels, 1962), *Post-Doctoral Fellow in Biochemistry.*

Nobuhiko Katsura, D.D.S., Ph.D. (Tokyo School of Medicine and Dentistry, 1958, 1962), *Post-Doctoral Fellow in Biochemistry.*

Kazuo Kawahara, Ph.D. (Univ. Osaka, 1962), *Post-Doctoral Fellow in Biochemistry.*

Annette G. Kirshner, Ph.D. (Duke, 1963), *Post-Doctoral Fellow in Biochemistry.*

Shared Kulkarni, Ph.D. (Univ. of the Pacific, 1964), *Post-Doctoral Fellow in Biochemistry.*

Bettie Sue Siler Masters, Ph.D. (Duke, 1963), *American Cancer Society Post-Doctoral Fellow.*

Charles Nelson, Ph.D. (State Univ. of Iowa, 1962), *Post-Doctoral Fellow in Biochemistry.*

Sasao Nishizaki, Ph.D. (Kyoto Univ., Japan, 1961), *N.I.H. Post-Doctoral Fellow.*

Elizabeth S. Pugh, Ph.D. (Duke, 1964), *Post-Doctoral Fellow in Biochemistry.*

Tomomi Sakurada, D.M.Sc. (Keio Univ., Japan, 1958), *Post-Doctoral Fellow in Biochemistry.*

William James Smith, Ph.D. (Duke, 1963), *American Heart Association Post-Doctoral Research Fellow.*

Henry O. Stone, Jr., Ph.D. (Duke, 1964), *A.C.S. Post-Doctoral Fellow.*

Takeo Terai, Ph.D., M.D. (Osaka Univ., 1952, 1959), *Post-Doctoral Fellow in Biochemistry.*

Moseley Waite, Ph.D. (Duke, 1963), *American Cancer Society Post-Doctoral Fellow.*

Ian Perry Williamson, Ph.D. (Univ. of Birmingham, England, 1963), *Post-Doctoral Fellow in Biochemistry.*

The required course in biochemistry for first-year students is given over a period of eighteen weeks in the first term. The first phase is devoted to a survey of the chemistry of the materials fundamental to all life proteins, fats and carbohydrates, and the nature of enzymatic action. This is followed by consideration of those events in intermediary metabolism common to the life of all mammalian cells. The special metabolism of muscle, kidney, bone, erythrocytes, liver, connective tissue, and the chemical aspects of digestion, respiration, electrolyte, acid-base and fluid balance are presented with relation to the study of the physiology of the organs so as to facilitate integration and correlation of the two disciplines.

Advanced Biochemical Laboratory. This course is specifically designed for third year medical students who select Biochemistry or a closely related area for specialization for the Fall quarter. The laboratory experience will emphasize modern laboratory techniques, such as radioisotope detection, chromatography and spectrophotometry. These techniques will be illustrated by experiments from diverse areas of biochemistry such as lipid metabolism, protein biosynthesis and enzyme kinetics. Students will have the time and opportunity to modify and extend the basic formal experiments. Simultaneous registration in Biochemistry of Disease, Energy Metabolism and Seminar is highly recommended. Sixteen hours per week for 18 weeks, first and second quarters, limited to 20 students. Dr. Lynn, Dr. Rosett and Staff.

Biochemistry of Disease. This course is designed for the third or fourth year medical student who is interested in the primary defect, manifestations and diagnostic aspects of diseases of metabolic or genetic

origin. Examples of emphasis would include a study of the primary defects in diabetes mellitus and other endocrine disorders, disturbances of electrolyte metabolism, genetic lipidoses, etc. Two hours per week for 18 weeks, first and second quarters, limited to 40 students. Dr. Thiers and Staff.

Biochemistry-Medical Scientists Seminar. This seminar is designed for the third year medical student who selects Biochemistry for his area of specialization. It will be a cohesive force which will strive to give perspective to the overall third year biochemistry program through student participation and guest speakers. One hour per week for 36 weeks, limited to 20 students. Dr. Byrne and Staff.

Chemistry of Natural Products. This is a required course in the Ph.D. program in Biochemistry and is available to all who wish a more sophisticated understanding of the molecular structure, physical and chemical properties of sugars, polysaccharides, fatty acids, simple and complex lipids, steroids, etc. Two hours per week for 18 weeks, first and second quarters, limited to 40 students. Dr. Davidson.

Energy Metabolism. This required course in the Ph.D. program is often selected as part of a minor in Biochemistry. It is a lecture course on the intermediary metabolism of carbohydrates and lipids. Included are detailed consideration of biological oxidations, oxidative phosphorylation and the control of energy yielding pathways. Three hours per week for 18 weeks, first and second quarters, limited to 40 students. Dr. Wakil, Dr. Wheat, and Dr. Fridovich.

Nitrogen Metabolism. A required lecture course in the Ph.D. program, this course is often selected as part of a minor in Biochemistry. It is devoted to consideration of the biosynthesis of nitrogen-containing compounds including amino acids, purines, pyrimidines and proteins. The fate of preformed or synthesized nitrogen containing compounds is also discussed. Amino acid biosynthesis is used as an opportunity to discuss the control of biosynthetic pathways through enzyme inhibition and regulation of protein biosynthesis. Two hours per week for 18 weeks, third and fourth quarters, limited to 40 students. Dr. Kamin, Dr. Greene, and Dr. Kirshner.

Proteins and Enzymes. This is a required lecture course in the Ph.D. program. After consideration of the chemical characterization and synthesis of amino acids, peptides and proteins, the theoretical basis and interpretation of physical techniques such as ultracentrifugation, spectrophotometry, titration, viscometry, light scattering, x-ray diffraction, and optical rotatory dispersion as applied to proteins are discussed in detail. After a treatment of enzyme kinetics, enzymes are considered in terms of the mechanism of their action and useful chemical models of enzyme activity. The terminal series of lectures is used

to illustrate current research efforts which are aimed at a molecular understanding of the known physiological properties of selected enzymes and structural proteins. Four hours per week for 18 weeks, third and fourth quarters, limited to 40 students. Dr. Tanford, Dr. Hill, and Dr. Byrne.

GENETICS. This is a required course in the genetics Ph.D. program but will also be available to other students. It will be taught by faculty from the genetics division of the Biochemistry Department and will include a comprehensive survey of classical genetics, mammalian genetics, microbial and virus genetics, cytogenetics, population genetics, functions of DNA, functions of RNA and genetic mechanisms. Three hours per week for 36 weeks, limited to 40 students. Dr. Guild and Dr. Gross.

CLINICAL CHEMISTRY LABORATORY. Individual students may participate in the program of the Clinical Chemistry Laboratory. Students must receive the permission of the instructor. Minimum of 20 clock hours per week for 3-9 weeks, limited to 8 students. Dr. Thiers.

GRADUATE STUDENT SEMINAR. This is a required part of the Ph.D. program. Each Ph.D. candidate must register for two semesters and he is expected to attend regularly during his entire time in the Ph.D. program. During the first semester students give a seminar on one of a series of related topics under the direction of one faculty member. During the second semester students select their own topics and an appropriate faculty adviser. One hour per week for 36 weeks, limited to 25 students. Staff.

FACULTY AND GUEST SPEAKER SEMINAR. During the school year there is at least one seminar per week based on original research by the faculty or invited guests. This is not a formal course, but students are expected to attend.

RESEARCH. Students may register for research under the direction of an individual member of the faculty. Permission to register must be sought from the faculty member concerned. The total time, days and hours are by arrangement with the selected research director.

ENDOCRINOLOGY

James B. Wyngaarden, M.D. (Univ. of Michigan, 1948), *Professor of Medicine, Associate Professor of Biochemistry (Director).*

William M. Nicholson, M.D. (Johns Hopkins, 1931), *Professor of Medicine, Assistant Dean in Charge of Postgraduate and Continuing Education.*

Roy T. Parker, M.D. (Med. Coll. of Virginia, 1944), *Professor of Obstetrics and Gynecology.*

James B. Sidbury, Jr., M.D. (Columbia, 1947), *Associate Professor of Pediatrics, Director of Clinical Research Unit.*

Jack L. Kostyo, Ph.D. (Cornell, 1957), *Associate Professor of Physiology.*

William S. Lynn, M.D. (Columbia, 1946), *Associate Professor of Medicine and Biochemistry.*

Harry T. McPherson, M.D. (Duke, 1948), *Associate Professor of Medicine (Director of Endocrine Clinic).*

C. Donald Christian, M.D. (Duke, 1958), *Associate Professor of Obstetrics and Gynecology.*

Charles H. Peete, Jr., M.D. (Harvard, 1947), *Associate Professor of Obstetrics and Gynecology.*

Robert S. Stempfel, Jr., M.D. (Vanderbilt, 1952), *Associate Professor of Pediatrics, Assistant Professor of Physiology.*

James O. Wynn, M.D. (Cornell, 1951), *Assistant Professor of Medicine.*

Rubin Bressler, M.D. (Duke, 1957), *Assistant Professor of Medicine (Director of Diabetic Clinic).*

Harold Lebovitz, M.D. (Pittsburgh, 1956), *Assistant Professor of Medicine (Director of Endocrine Laboratory).*

G. Eric Marler, M.D., C.M. (McGill, 1958), *Associate in Medicine and Biochemistry.*

Robert Gibbs, M.D. (Duke, 1959), *Associate in Medicine.*

Walter Lusk, M.D. (Emory, 1950), *Instructor in Medicine.*

Fellows

Abdul-Aziz Al-Assadi, M.D. (Duke, 1957), *Pediatrics.*

Richard Breuer, M.D. (Yale, 1957), *Medicine.*

Lawrence A. Frohman, M.D. (Michigan, 1958), *Medicine.*

Edward Horton, M.D. (Harvard, 1957), *Medicine.*

Peter Kohler, M.D. (Duke, 1963), *Medicine.*

Elizabeth A. Lamb, M.D. (Tennessee, 1958), *Pediatrics.*

Zachariah Newton, M.D. (Jefferson, 1962), *Obstetrics and Gynecology.*

Bagher Sheikolislam, M.D. (Tehran, Iran, 1960), *Pediatrics.*

Bruce Squires, M.D., Ph.D. (Western Ontario, 1958 and 1962), *Medicine.*

Robert E. Fellows, M.D. (McGill, 1959), *Biochemistry.*

Lawrence Walker, M.D. (Duke, 1960), *Obstetrics and Gynecology.*

The Division of Endocrinology was organized by Dr. E. C. Hamblen in 1936 as a division of the Department of Obstetrics and Gynecology. In 1955 it was reorganized as an integrated service with a staff drawn from several clinical and preclinical departments. Its objective is to give comprehensive training in basic and clinical endocrinology and metabolism, particularly at the postgraduate level. Although individual senior staff members have their own special clinical and research programs, the division is organized so that clinics, conferences, ward rounds and seminars are participated in as joint ventures by the entire staff. The endocrine laboratory and its services are available to all members of the staff equally. Resident physicians from Medicine, Obstetrics and Gynecology and Pediatrics rotate through the Endocrine Division. At any one time there are usually four residents assigned to the division. Clinical and research fellows and trainees are assigned to individual senior staff members, depending on their major interest, but all participate essentially equally in the clinics, teaching rounds, conferences, etc.

The Endocrine Clinic meets four mornings and the Metabolism-Diabetes Clinic one morning each week. All fellows have the opportunity to attend these clinics and in addition the clinical fellows assist in the care of the private patients with endocrine and metabolic disturbances including diabetes. Twice a month the endocrine clinic meets jointly with the neurosurgical tumor follow-up clinic to review patients with pituitary tumors and related brain lesions. Ward rounds on in-patients are held from 4-5 p.m. Monday and Friday and at 9 a.m. on Wednesday each week. An endocrine conference is conducted weekly. In addition, each of the supporting services (Medicine, Obstetrics and Gynecology and Pediatrics) has special conferences, lectures and seminars of endocrine interest which are available to the staff.

MEDICINE

Eugene Anson Stead, Jr., M.D. (Emory, 1932), *Florence McAlister Professor of Medicine and Chairman of the Department.*

Morton D. Bogdonoff, M.D. (Cornell, 1948), *Professor of Medicine.*

J. Lamar Callaway, M.D. (Duke, 1932), *Professor of Dermatology.*

E. Harvey Estes, M.D. (Emory, 1947), *Professor of Medicine.*

Oscar C. E. Hansen-Pruss, M.D. (Johns Hopkins, 1924), *Professor of Medicine.*

Albert Heyman, M.D. (Maryland, 1940), *Professor of Neurology.*

Walter Kempner, M.D. (Heidelberg, 1927), *Professor of Medicine.*

Grace P. Kerby, M.D. (Duke, 1946), *Professor of Medicine.*

Henry D. McIntosh, M.D. (Pennsylvania, 1950), *Professor of Medicine.*

Elijah E. Menefee, Jr., M.D. (Duke, 1936), *Professor of Medicine.*

William M. Nicholson, M.D. (Johns Hopkins, 1931), *Professor of Medicine in Charge of Diseases of Metabolism, and Assistant Dean in Charge of Postgraduate and Continuing Education.*

Edward S. Orgain, M.D. (Virginia, 1930), *Professor of Medicine.*

Elbert L. Persons, M.D. (Harvard, 1927), *Professor of Medicine, Director of Student Health, and Associate Professor of Preventive Medicine and Public Health.*

Julian M. Ruffin, M.D. (Virginia, 1926), *Professor of Medicine.*

R. Wayne Rundles, M.D. (Duke, 1940), *Professor of Medicine.*

Herbert O. Sieker, M.D. (Washington University, 1948), *Professor of Medicine and Assistant Dean for Coordination of Educational Affairs.*

J. Graham Smith, M.D. (Duke, 1950), *Professor of Dermatology.*

Malcolm P. Tyor, M.D. (Duke, 1946), *Professor of Medicine.*

James B. Wyngaarden, M.D. (Michigan, 1948), *Professor of Medicine, and Associate Professor of Biochemistry.*

James P. Hendrix, M.D. (Pennsylvania, 1930), *Associate Professor of Medicine and Therapeutics.*

Kaye H. Kilburn, M.D. (Utah, 1954), *Associate Professor of Medicine, and Chief, Medical Service, Durham V.A. Hospital.*

William S. Lynn, M.D. (Columbia, 1946), *Associate Professor of Medicine, and Associate Professor of Biochemistry.*

Harry T. McPherson, M.D. (Duke, 1948), *Associate Professor of Medicine.*

Talmage L. Peele, M.D. (Duke, 1934), *Associate Professor of Neurology, Professor of Anatomy, and Assistant Professor of Pediatrics.*

Ernst Peschel, M.D. (Berlin, 1930), *Associate Professor of Medicine.*

John B. Pfeiffer, M.D. (Cornell, 1942), *Associate Professor of Neurology.*

David T. Smith, M.D. (Johns Hopkins, 1922), *Associate Professor of Medicine, and James B. Duke Professor of Microbiology.*

William F. Barry, Jr., M.D. (Pennsylvania, 1946), *Assistant Professor of Medicine, and Associate Professor of Radiology.*

Rubin Bressler, M.D. (Duke, 1957), *Assistant Professor of Medicine.*

John F. Flanagan, M.D. (Duke, 1953), *Assistant Professor of Medicine, and Instructor in Microbiology.*

Walter L. Floyd, M.D. (Johns Hopkins, 1954), *Assistant Professor of Medicine.*

Samuel J. Friedberg, M.D. (Pennsylvania, 1952), *Assistant Professor of Medicine.*

Joseph C. Greenfield, M.D. (Emory, 1956), *Assistant Professor of Medicine.*

John Laszlo, M.D. (Harvard, 1955), *Assistant Professor of Medicine.*

Harold E. Lebovitz, M.D. (Pittsburgh, 1956), *Assistant Professor of Medicine.*

E. Eugene Owen, M.D. (Washington Univ., 1956), *Assistant Professor of Medicine.*

George W. Paulson, M.D. (Duke, 1956), *Assistant Professor of Neurology.*

Richard M. Portwood, M.D. (Southwestern, 1954), *Assistant Professor of Medicine.*

Roscoe R. Robinson, M.D. (Oklahoma, 1954), *Assistant Professor of Medicine.*

Herbert A. Saltzman, M.D. (Jefferson, 1952), *Assistant Professor of Medicine.*

Robert E. Whalen, M.D. (Cornell, 1956), *Assistant Professor of Medicine.*

James O. Wynn, M.D. (Cornell, 1951), *Assistant Professor of Medicine.*

Stanley H. Appel, M.D. (Columbia, 1960), *Associate in Medicine.*

Irwin A. Brody, M.D. (Pennsylvania, 1956), *Associate in Neurology.*

C. Edward Buckley, M.D. (Duke, 1954), *Associate in Medicine.*

James R. Clapp, M.D. (North Carolina, 1957), *Associate in Medicine.*

McDonald Dick, M.D. (Johns Hopkins, 1928), *Associate in Medicine, and Assistant Professor of Physiology and Pharmacology.*

T. David Elder, M.D. (Duke, 1957), *Associate in Medicine.*

Robert H. Gibbs, M.D. (Duke, 1959), *Associate in Medicine.*

Ralph J. Gorten, M.D. (Pennsylvania, 1955), *Associate in Medicine.*

J. Caulie Gunnells, M.D. (South Carolina, 1956), *Associate in Medicine.*

Rafael R. Hernandez, M.D. (Duke, 1958), *Associate in Medicine.*

O. William Jones, M.D. (Oklahoma, 1957), *Associate in Medicine.*

Thomas T. Jones, M.D. (Johns Hopkins, 1932), *Associate in Medicine.*

Robert F. Klein, M.D. (Alabama, 1955), *Associate in Medicine.*

Eric Marler, M.D. (McGill, 1958), *Associate in Medicine.*

Charles E. Mengel, M.D. (Johns Hopkins, 1957), *Associate in Medicine.*

James J. Morris, M.D. (State Univ. of New York, 1959), *Associate in Medicine.*

Barbara C. Newborg, M.D. (Johns Hopkins, 1949), *Associate in Medicine.*

Suydam Osterhout, M.D. (Duke, 1950), Ph.D. (Rockefeller Inst., 1959), *Associate in Medicine, and Assistant Professor of Microbiology.*

Charles E. Rackley, M.D. (Duke, 1958), *Associate in Medicine.*

Harold R. Silberman, M.D. (Washington Univ., 1956), *Associate in Medicine.*

Charles W. Styron, M.D. (Duke, 1938), *Associate in Medicine.*

Howard K. Thompson, M.D. (Columbia, 1953), *Associate in Medicine.*

Andrew G. Wallace, M.D. (Duke, 1959), *Associate in Medicine.*

John S. Warner, M.D. (Vanderbilt, 1956), *Associate in Neurology.*

Sherwood W. Barefoot, M.D. (Duke, 1938), *Instructor in Dermatology.*

Woodrow W. Batten, M.D. (Bowman Gray, 1944), *Instructor in Medicine.*
Richard I. Breuer, M.D. (Yale, 1957), *Instructor in Medicine.*
John R. Bumgarner, M.D. (Med. Coll. of Virginia, 1939), *Instructor in Medicine.*
Paul C. Campbell, M.D. (Buffalo, 1936), *Instructor in Dermatology.*
A. Derwin Cooper, M.D. (George Washington, 1932), *Instructor in Medicine.*
George W. Crane, M.D. (Northwestern, 1946), *Instructor in Dermatology.*
Joe B. Currin, M.D. (Bowman Gray, 1961), *Instructor in Medicine.*
John L. Farmer, M.D. (Duke, 1955), *Instructor in Dermatology.*
Glen R. Finlayson, M.D. (Utah, 1961), *Instructor in Dermatology and Chief Resident, Division of Dermatology.*
Walter C. Fitzgerald, M.D. (Virginia, 1943), *Instructor in Dermatology.*
Lawrence A. Frohman, M.D. (Michigan, 1958), *Instructor in Medicine.*
Robert E. Gaddy, M.D. (Duke, 1959), *Instructor in Medicine.*
Glen A. Garrison, M.D. (Bowman Gray, 1958), *Instructor in Medicine.*
Peter Gebel, M.D. (Harvard, 1958), *Instructor in Medicine.*
William M. Ginn, M.D. (North Carolina, 1959), *Instructor in Medicine.*
Alisa R. Gutman, M.D. (Hebrew Univ., 1958), *Instructor in Medicine.*
Leo J. Heaphy, M.D. (Buffalo, 1956), *Instructor in Medicine.*
Jacqueline C. Hijmans, M.D. (State Univ., Leyden, 1949), *Instructor in Medicine.*
S. Frank Horne, M.D. (Duke, 1942), *Instructor in Dermatology.*
Edward S. Horton, M.D. (Harvard, 1957), *Instructor in Medicine.*
George V. Irons, M.D. (Med. Coll. of Alabama, 1956), *Instructor in Medicine.*
Marvin Kahn, M.D. (Johns Hopkins, 1958), *Instructor in Medicine.*
George E. Koury, M.D. (Tulane, 1944), *Instructor in Medicine.*
Emmett S. Lupton, M.D. (New York Univ., 1938), *Instructor in Dermatology.*
John A. Lusk, M.D. (Alabama, 1951), *Instructor in Medicine.*
Walter C. Lusk, M.D. (Emory, 1950), *Instructor in Medicine.*
Thomas G. McGinn, M.D. (State Univ. of New York, 1957), *Instructor in Medicine.*
Michael E. McLeod, M.D. (Duke, 1960), *Instructor in Medicine, and Chief Resident in Medicine.*
Earl N. Metz, M.D. (Duke, 1961), *Instructor in Medicine.*
Hiroshi Nagaya, M.D. (Tokyo, 1956), *Instructor in Medicine.*
John B. Nowlin, M.D. (Duke, 1957), *Instructor in Medicine.*
Henry T. Perkins, M.D. (Duke, 1957), *Instructor in Medicine.*
Waguih M. Raphael, M.D. (Cairo, 1957), *Instructor in Medicine.*
J. Sidney Rice, M.D. (Ohio State, 1940), *Instructor in Dermatology.*
Peter B. Rowe, M.D. (Univ. of Sidney, 1958), *Instructor in Medicine.*
Fred W. Schoonmaker, M.D. (Colorado, 1961), *Instructor in Medicine, and Chief Resident, Medical Service, Durham V.A. Hospital.*
Allen D. Smith, M.D. (Georgia, 1937), *Instructor in Dermatology.*
Bruce P. Squires, M.D. (Western Ontario, 1958), *Instructor in Medicine.*
Joseph W. Stiefel, M.D. (Tennessee, 1958), *Instructor in Neurology and Chief Resident, Division of Neurology.*
Richard C. Stone, M.D. (Duke, 1962), *Instructor in Medicine.*
Daniel N. Tucker, M.D. (Duke, 1958), *Instructor in Medicine.*
Paul D. Webster, M.D. (Bowman Gray, 1956), *Instructor in Medicine.*
David G. Welton, M.D. (Wisconsin, 1935), *Instructor in Dermatology.*
Ruby L. Wilson, B.S.N. (Pittsburgh, 1954), *Instructor in Medicine.*
Donald Aanerud, *Research Associate in Medicine and in Surgery.*

Ruth L. Peschel, M.D. (Berlin, 1931), *Research Assistant in Medicine.*
Clotilde Schlayer, Ph.D. (Heidelberg, 1927), *Research Assistant in Medicine.*
Preston W. Smith, *Technical Associate in Clinical Microscopy.*
C. Frank Starmer, B.S. (Duke, 1963), *Research Associate in Medicine.*

Fellows

William A. Carter, M.D. (Duke, 1963).
William S. Collins, M.D. (Duke, 1960).
Ronnie L. Cox, M.D. (Duke, 1961).
Henry B. Dixon, M.D. (Duke, 1960).
John E. Douglas, M.D. (Johns Hopkins, 1963).
George J. Ellis, M.D. (Harvard, 1963).
Mark L. Entman, M.D. (Duke, 1963).
Harvey E. Grode, M.D. (Duke, 1960).
Peter O. Kohler, M.D. (Duke, 1963).
Yi-Hong Kong, M.D. (Taiwan, 1958).
Charles M. Mansbach, M.D. (New York, 1963).
Huey G. McDaniel, M.D. (Alabama, 1963).
Donald S. Miller, M.D. (Harvard, 1962).
J. Frederic Mushinski, M.D. (Harvard, 1963).
Robert H. Peter, M.D. (Duke, 1961).
Joel R. Temple, M.D. (Jefferson, 1960).
John M. Thompson, M.D. (Western Ontario, 1961).
William G. Troyer, M.D. (Pittsburgh, 1960).
William B. Weglicki, M.D. (Maryland, 1962).
Robert M. Wilkins, M.D. (Bowman Gray, 1963).

Assistant Residents

Robert S. Adelstein, M.D. (Harvard, 1959).
Thomas E. Andreoli, M.D. (Georgetown, 1960).
Bernard A. Bernstein, M.D. (State Univ. of New York, 1963).
John G. Blount, M.D. (North Carolina, 1960).
Joseph O. Broughton, M.D. (Duke, 1963).
Neil C. Brown, M.D. (Albany, 1961).
Charles T. Caskey, M.D. (Duke, 1963).
C. Franklin Church, M.D. (Duke, 1963).
Stanley N. Cohen, M.D. (Pennsylvania, 1960).
Wesley A. Cook, M.D. (Oregon, 1963).
Franklin P. Dalton, M.D. (Duke, 1960)
Anthony R. Dowell, M.D. (Indiana, 1963).
Ray R. Durrett, M.D. (Duke, 1963).
Amos C. Gipson, M.D. (Vanderbilt, 1960).
Jack K. Goldman, M.D. (Pittsburgh, 1959).
H. Courtenay Harrison, M.D. (Duke, 1959).
Martin A. Hatcher, M.D. (Duke, 1962).
Brunildo A. Herrero, M.D. (Florida, 1960).
David H. Holloway, M.D. (Tennessee, 1961).
Pascal J. Imperato, M.D. (Duke, 1963).
Burwell O. Jones, M.D. (Michigan, 1959).
Elizabeth P. Kanof, M.D. (New York, 1960).
Julian Katz, M.D. (Chicago, 1962).
Lester J. Krasnogor, M.D. (New York, 1963).
William B. Kremer, M.D. (State Univ. of New York, 1960).
E. Joseph LeBauer, M.D. (Duke, 1960).
Marcellin Lemaire, M.D. (Laval Univ., 1960).
Edward L. Lewis, M.D. (Duke, 1963).
William C. McAfee, M.D. (Tennessee, 1961).
Richard V. McCloskey, M.D. (Rochester, 1960).
Patrick A. McKee, M.D. (Oklahoma, 1962).
Bert W. O'Malley, M.D. (Pittsburgh, 1963).
Carl S. Phipps, M.D. (North Carolina, 1962).
Vade G. Rhoades, M.D. (Bowman Gray, 1960).
Jerome Ruskin, M.D. (Albert Einstein, 1960).
Haskel Schiff, M.D. (New York, 1963).

John S. Simmonds, M.D. (Columbia, 1963).
Roger W. Turkington, M.D. (Harvard, 1963).
John E. Watt, M.D. (Kansas, 1962).
H. Lake Westfall, M.D. (Duke, 1960).
Alan C. Whitehouse. M.D. (Cincinnati, 1963).

Interns

Page A. Anderson, M.D. (Duke, 1964).
Crawford F. Barnett, M.D. (Duke, 1964).
Willis H. Bell, M.D. (Duke, 1964).
Fred R. Cobb, M.D. (Mississippi, 1964).
John L. Dobson, M.D. (Duke, 1964).
Marshall C. Dunaway, M.D. (Emory, 1964).
Robert O. Friedel, M.D. (Duke, 1964).
Richard Gorenberg, M.D. (Duke, 1964).
Allan M. Greenberg, M.D. (State Univ. of New York, 1964).
Clarence E. Grim, M.D. (Missouri, 1964).
Jordan U. Gutterman, M.D. (Med. Coll. of Virginia, 1964).
Frank T. Hannah, M.D. (Duke, 1964).
Lee S. Harris, M.D. (Duke, 1964).
Joe T. Hartzog, M.D. (Oklahoma, 1964).
Paul W. Hathaway, M.D. (Oklahoma, 1964).
Gilbert S. Hunn, M.D. (Temple, 1964).
Herbert E. Kann, M.D. (Duke, 1964).
John R. Karickhoff, M.D. (Duke, 1964).
David W. Martin, M.D. (Duke, 1964).
Robert C. Noble, M.D. (Duke, 1964).
Samuel D. Ravenel, M.D. (Duke, 1964).
Carl J. Rubenstein, M.D. (Duke, 1964).
B. Winfred Ruffner, M.D. (Duke, 1964).
Stephen F. Schaal, M.D. (Ohio State, 1964).
Philip T. Shiner, M.D. (Duke, 1964).
Spencer Shropshire, M.D. (Southwestern, 1964).
Douglas P. Zipes, M.D. (Harvard, 1964).

The Department of Medicine traditionally has the responsibility of preparing the student for a lifetime of learning as he gives care to patients who ask him for help. The first step is to begin to think and act like a doctor. Two courses in the first year—Introduction to Clinical Medicine and Clinical Microscopy—prepare the student to take an active role in patient care.

The student assigned to Medicine, or electing Medicine, in the second and fourth years acts in the role of a physician. His desire to give good care is the motive which drives him to excellence. He learns to properly identify the problems of the patient. Having identified the problems, he marshalls the information which he can bring to bear on them by his past training; he recognizes the gaps in his knowledge as he attempts to focus the information learned from the basic sciences onto the specific clinical problem. Using the patient as his means of integration, he continues his reading in anatomy, physiology, microbiology, pharmacology and biochemistry. In this clinical setting he has the opportunity to speak many words which he has previously only read; he discusses the problem with his fellow students, interns, residents and senior staff; he gains familiarity with ideas and concepts by actively manipulating them.

The student crystallizes his idea of the best diagnostic and thera-

peutic approach to this particular patient. He identifies the reasons for each of these decisions. He has real curiosity to see if his evaluation of the situation is correct or if he will have to admit that certain data which he had interpreted as rock-like support for his house of cards have turned out to be shifting sand. He learns that the course of biology is uninfluenced by strong statements, by the rank of the faculty member, or by the number of supporting references not quite applicable to the points in question.

Under guidance from his fellow students and from faculty of all ranks, he slowly appreciates the difficulties of learning in this system of multiple variables operating on only partially defined substrates. Part of a doctor's learning is only experimental. He knows from living with his patients that certain things are possible, but he does not know the underlying sequence of events. In other instances, his learning is more precise because he understands and can control some of the important variables. He must learn both the liabilities and virtues of attempting to use logic in clinical practice.

The goal of the Department of Medicine is for the student to have as many learning experiences as possible in which he plays an active role. We hope that he will enjoy these learning experiences so much that he will continue them as long as he sees patients. We are not interested in covering the entire field of medicine. If one of our graduates meets a new problem, correctly identifies it and has pleasure in solving it, we are satisfied. We are not concerned that a new area of knowledge is being explored without our guidance.

In caring for our patients with ill-defined genetic and acquired differences and with many variables of unknown strength at play, many erroneous conclusions are drawn. The student has to learn to examine statements, both oral and written, with care, and to ask of all authorities the source of data which underlie their conclusions. One way for the student to learn the difficulties in drawing accurate conclusions about biological systems is to give him the opportunity to establish some fact on the basis of his own work. We call this research, and find it a very effective method of teaching. The intellectual discipline involved better prepares him for the role of a lifetime learner.

The health field is a broad one. Anyone with intelligence enough to gain entrance to the Medical School can find an area where he can be happy and productive. We are interested in producing manpower for the entire field. We are not interested in molding our students into any single career in the health field. The faculty accepts the fact that our intake is heterogeneous and that our output will be heterogeneous. Our role is to identify the area where the individual will be most productive and happy, and to help him reach this goal. We will continue to produce general practitioners, specialists, administrators, research

workers, biologists, government workers and various combinations. There is no special honor attached to any of these roles. Our primary interest is that our graduates are productive and receive emotional and intellectual satisfaction from their work.

Introduction to Clinical Medicine. This course is initiated in the first year by introductory lectures, case discussions and instruction in methods by physical examination and history taking. Early in the course, students begin work at the bedside in the examination of selected patients. The emphasis throughout is placed on instruction individually and in small groups. The interpretation and pathologic physiology of abnormal findings are stressed. Instruction in the more specialized methods of examination is provided by coordinating the lectures, case discussions and individual student instruction from the departments of Medicine, Neurology, Obstetrics and Gynecology, Pediatrics, Psychiatry, Radiology and Surgery. In addition, the lectures and laboratory sessions in Clinical Microscopy are coordinated with the over-all program. In the latter part of the year, special emphasis is placed on student correlation of the history, physical finding and pathologic physiology in the individual patient problem.

Clinical Microscopy is given in the first year. This course, along with lectures and assignments providing practice in history taking and physical diagnosis, comprises an introduction to medicine designed to equip the student to participate in patient care on the wards and in the clinics. The essentials of hematology are reviewed. Laboratory work includes blood cell counts, the preparation and interpretation of blood films, and the examination of fresh material, such as urine, stools, spinal fluids, sputum, transudates and exudates. This course is supplemented in the clinical years by hematology conferences and by daily ward and laboratory rounds.

Second-Year Medicine. The student spends one term of his second year in Medicine where he is assigned to one of the medical wards or to the medical clinic. He forms part of a medical team composed of interns, first-year residents and senior staff, and takes an active part in the care of patients. The number of patients assigned to him does not vary with the load. He is given this protection to allow him time for synthesis of his basic science experiences with the problems of his patients. When indicated, the undergraduate experiences are integrated with the graduate program. In such an instance, the program of each student is worked out individually.

Advanced General Medicine. This course provides advanced training and experience in general medicine. The student is assigned to the inpatient and outpatient services to work up and follow general medical problems in close association with the house staff and consultants. This course will teach techniques of diagnosis and application

of therapeutic programs. The student is responsible for the patient and will learn about disease and its management through the staff directly concerned with the patient, and through the consultant services which will assist in the diagnosis and care. Full-time for 9 weeks. Offered year-round—no limitation on student number. Dr. Stead and Department of Medicine staff.

Allergy and Chest Diseases. This course provides both an introduction and depth in the clinical and laboratory aspects of allergic and respiratory diseases. The student works up and follows the patients assigned to this service in both the outpatient department and in the hospital or in consultation. There is instruction in allergy and clinical immunology with seminars and conferences in more basic immunology in cooperation with the Department of Microbiology and Immunology. The student learns the techniques and interpretations of pulmonary function studies and may attend seminars and conferences in pulmonary physiology in cooperation with the Department of Physiology. Provisions are made for library or clinical research problems. Full-time for 9 weeks. Offered year-round—limited to 6 students. Drs. Sieker, Hansen, Menefee, Kilburn, Saltzman, Buckley and staff.

Courses offered part-time and in coordination with other basic science or clinical areas are: allergy clinic, chest clinic, clinical immunology laboratory, pulmonary function laboratory, allergy and clinical immunology seminar and respiratory disease seminar.

Behavioral Medicine. This course provides training in understanding and applying the principles of human behavior in managing patient problems in general medicine. The student works with and follows patients in the medical outpatient and inpatient divisions, being supervised by the senior staff and associate staff of the division. Emphasis is placed upon interpreting the natural history of illness and the patient's response to the illness, and upon utilizing the features of the individual's behavior as keys to the management of the clinical problem. There is a seminar and patient conference review of the basic science information relative to this area and a series of comprehensive seminars conducted with the departments of Sociology and Psychology. Participation in clinical and laboratory research problems is part of the program. Full-time for 9 weeks. To be offered year-round—limited to 5 students. Drs. Bogdonoff, Klein and staff.

Cardiovascular Diseases. This course is primarily patient-oriented but allows the integration of problems in clinical evaluation and clinical care with those of more advanced laboratory investigation. The curriculum allows the student to develop a continuing relationship with one senior person in the cardiovascular division throughout the entire 9-week period. Since the division does offer a variety of learning experiences, the student may participate also in the forms of investigation

and care which are the particular interests of the individual section of the cardiovascular division. The student is assigned a certain number of patients for evaluation and follows these patients through their specialized study, participating in the phonocardiographic and electrocardiographic studies as well as cardiac catheterization if this is indicated. There are a number of conferences and seminars, including a student working conference in which the student presents and discusses the pertinent data derived on the patients he is following. There is a student seminar in which selected topics are reviewed to provide more completeness and depth in a given area. The student also participates in the scheduled conferences and clinics. Opportunity is provided for participation in related seminars in pathology and physiology. Full-time for 9 weeks. To be offered year-round—limited to 6 students. Drs. Orgain, McIntosh, Floyd, Whalen, Estes, Wallace, Hernandez and staff.

Dermatology. This course is an introduction to dermatology, with emphasis on diagnosis and management of skin disorders based on the pathophysiologic and biochemical alterations in these diseases. Students are assigned to patients in the hospital and are responsible for their supervised evaluation and care. In addition, the student receives extensive experience in the private and public outpatient departments where he performs diagnostic and treatment procedures under the direction of the staff. Scheduled seminars and conferences provide opportunity for group instruction. Although it is not the major emphasis of the course, interested students may participate in library, clinical or laboratory investigation. Full-time for 9 weeks. Offered year-round—limited to 4 to 8 students. Drs. Callaway, Smith and staff.

Gastroenterology. This course is designed to emphasize the role of the gastrointestinal tract and liver in general medical disorders, and to serve as an introduction to illnesses which primarily involve the liver and gastrointestinal tract. Experience is obtained from patients directly assigned to members of the senior staff as well as those seen through the private and staff consultation service in the outpatient gastroenterology clinic. In addition, the student rounds on all patients with the resident, fellow and senior staff. He also participates or assists in the various techniques available in the laboratory for the diagnosis and evaluation of gastroenterological disorders. There are clinical conferences in cooperation with the departments of Radiology and Pathology, weekly seminars concerned with the physiologic and biochemical problems related to hepatic and gastrointestinal function, and the opportunity for library or clinical research in a specific problem. Full-time for 9 weeks. Offered year-round—limited to 4 students. Drs. Ruffin, Tyor, Owen and staff.

Hematology (Cancer). This course is intended to provide advanced training in diagnosis and management of hematologic disorders,

including cancer in general. The student works up and follows patients in the inpatient and outpatient services. He participates in the special diagnostic studies and in the laboratory evaluation used in following these patients. There are seminars and conferences and the opportunity for library and clinical investigation in a particular problem area. Full-time for 9 weeks. Offered year-round—limited to 5 students. Drs. Rundles, Laszlo and Mengel.

Metabolism and Endocrinology. The student learns in greater depth the clinical and laboratory diagnosis of metabolic and endocrinologic disorders. He is responsible for the workup and follows patients on both the inpatient and outpatient services. He participates in the special studies and gains experience in managing metabolic disorders under the supervision of the staff. In particular, experience is provided in the endocrinology laboratory and in radioisotope techniques. Full-time for 9 weeks. Offered year-round—limited to 4 students. Drs. McPherson, Nicholson, Wyngaarden and staff.

Neurology. This course is intended to provide experience in the diagnosis and management of neurologic disorders. The student works up and follows patients on the inpatient and outpatient services. Experience is gained in the use of special techniques including electroencephalography. Opportunity is provided for library and clinical research. Full-time for 9 weeks. Offered year-round—limited to 6 students. Drs. Heyman, Pfeiffer, Warner and staff.

Renal Diseases. This course offers detailed instruction in the clinical and laboratory aspects of hypertension and nephrology. It provides the basic foundation for a physiological approach to the diagnosis and management of patients with renal disorders, abnormalities of fluid and electrolyte metabolism and hypertension. The student assumes full responsibility for the complete initial evaluation and subsequent follow-up of both inpatients and outpatients. Through the laboratory facilities, the student becomes familiar with the clinical application of specialized methods for the evaluation of renal function. Active participation in specialty rounds, conferences and seminars is required. Students are systematically introduced to the mechanics and therapeutic applications of hemodialysis and peritoneal dialysis, the diagnostic evaluation of the hypertensive patient, the physiological approach to disorders of fluid and electrolyte metabolism, elements of renal pathology (in cooperation with the Department of Pathology), and medical aspects of urologic surgery (in cooperation with the Division of Urologic Surgery). Although the primary emphasis is on education, the opportunity exists for limited participation in various research projects in clinical dialysis, immunologic aspects of renal disease or transplantation (in cooperation with the Division of Immunology), pathophysiology of renal disease, and the hormonal causes of hypertension. Full-time for 9 weeks. Of-

fered year-round—limited to 4 students. Drs. Robinson, Gunnells, Kempner, Peschel and staff.

These courses may be scheduled to run concurrently with more extensive participation in other areas: hypertension-renal clinic, renal pathology seminar, renal physiology seminar, clinical specialty conferences, and laboratory course.

RHEUMATOLOGY. This course is intended to provide experience in the care of patients with joint diseases. The student is responsible for patient work-up and care under the supervision of the staff. Of particular importance are the laboratory techniques used in evaluating this type of patient problem. Experience is also gained in cooperation with the physical therapy department in problems of rehabilitation. Full-time for 9 weeks. Offered year-round—limited to 4 students. Drs. Persons, Elder, Kerby and staff.

MEDICAL RESEARCH TRAINING PROGRAM

James B. Wyngaarden, M.D. (Univ. of Michigan, 1948), *Professor of Medicine and Associate Professor of Biochemistry; Director, Research Training Program.*

Irwin Fridovich, Ph.D. (Duke, 1955), *Assistant Professor of Biochemistry.*

Walter Guild, Ph.D. (Yale, 1951), *Associate Professor of Biochemistry (Biophysics).*

Samson Gross, Ph.D. (Columbia, 1953), *Associate Professor of Microbiology (Genetics).*

Kenneth McCarty, Ph.D. (Columbia, 1958), *Associate Professor of Biochemistry.*

Thomas McManus, M.D. (Boston Univ., 1955), *Assistant Professor of Physiology.*

Montrose Moses, Ph.D. (Columbia, 1949), *Associate Professor of Anatomy.*

G. Eric Marler, M.D., C.M. (McGill, 1958), *Associate in Medicine and Biochemistry.*

Stanley Appel, M.D. (Harvard, 1960), *Associate in Medicine.*

The Medical Research Training Program is an elective program available to qualified students after completion of the first two years of the curriculum, and to members of the Duke Hospital resident staff, Postdoctoral Fellows in the clinical and preclinical departments and qualified graduate students.

The objective of the program is to provide a more sound basis for the future work of those hoping to devote their lives to a career in investigative medicine and biology. Approximately 8 medical students and 8 postdoctoral fellows are accepted annually. Applicants are admitted upon recommendation by a faculty committee on the basis of a past academic performance, evidence of research bent and curiosity, and motivation toward an academic research career.

The program offers an academic year (September to June) of full-time research training in medical sciences basic to clinical investigation, and emphasizes primarily "cell biology." It includes three types of

activities: 1) Three months are devoted to an extensive series of laboratory experiences in cytology and fine structure cell and tissue culture, biochemical studies of cell growth, bacterial and phage genetics, protein synthesis and its genetic determination, physical biochemistry of nucleic acids and of proteins including antibodies and enzymes, membrane functions, and organized cellular controls. These three introductory months are designed to familiarize the student with concepts and experimental approaches in these fields, and with the use of important and complex tools and techniques not ordinarily taught in undergraduate courses. 2) Six months are devoted to a research problem conducted either in the general laboratory set apart for this program or in the laboratory of one of the faculty with whom the participant chooses to work. 3) Seven hours per week, throughout the year, are devoted to class work in mathematics, biostatistics and physics in courses expressly designed for students of this program, and one evening each week is devoted to seminar work. Special lectures are given by guests from the university faculty or from other institutions. The entire program is housed in a special wing of the W. B. Bell Medical Research Building, and is under the direction of members of the faculty who devote themselves largely to this training program.

The qualified medical student can participate in this program without delaying his graduation and without increasing the cost of his education. By using two summers of clinical studies, and by receiving elective credit for two of the four quarters in the training program, he enters his senior year abreast of his class. After the new curriculum begins, this course will fulfil requirements for the third or fourth basic science year. He receives a training stipend of $300 per month during those quarters of the program for which he does not receive curriculum credits toward graduation. He ultimately pays the same tuition as any other medical student.

The Graduate School of Duke University will also accept the total of the first two years of medical school plus participation in this program as residence time toward the degree of Doctor of Philosophy. In addition, the individual student must satisfy the language and dissertation requirements of the Graduate School and any special requirements stipulated by the department in which he elects to obtain this degree. The combined degree program is arranged individually and requires a minimum of 5½ to 6 years.

It is suggested that medical students undertake this program at the completion of the first years of the curriculum and then return to the normal clinical medical curriculum. Such students should also expect to undertake two or more years of a postdoctoral research fellowship in the course of their residency training in order to prepare themselves fully for research oriented career in academic medicine.

MICROBIOLOGY AND IMMUNOLOGY

Norman F. Conant, Ph.D. (Harvard, 1933), *James B. Duke Professor of Microbiology and Chairman of the Department.*

David T. Smith, M.D. (Johns Hopkins, 1922), *James B. Duke Professor of Microbiology and Associate Professor of Medicine.*

John E. Larsh, Jr., Sc.D. (Johns Hopkins, 1943), *Professor of Parasitology at Duke and University of North Carolina.*

D. Bernard Amos, M.D. (London, 1951), *Professor of Immunology and Associate Professor of Experimental Surgery.*

Joseph W. Beard, M.D. (Vanderbilt, 1929), *Associate Professor of Virology and James B. Duke Professor of Surgery.*

Hilda Pope Willett, Ph.D. (Duke, 1949), *Professor of Microbiology.*

Eugene D. Day, Ph.D. (Delaware, 1952), *Professor of Immunology.*

Richard O. Burns, Ph.D. (Univ. of Illinois, 1962), *Assistant Professor of Microbiology.*

Suydam Osterhout, M.D. (Duke, 1950), Ph.D. (Rockefeller Inst., 1959), *Associate Professor of Microbiology, Assistant Professor of Medicine.*

Richard S. Metzgar, Ph.D. (Buffalo, 1959), *Associate Professor of Immunology.*

Chester Zmijewski, Ph.D. (Buffalo, 1960), *Assistant Research Professor of Immunology.*

C. Edward Buckley, M.D. (Duke, 1954), *Associate in Immunology.*

H. Stewart Nielsen, Jr., Ph.D. (Ohio State, 1964), *Instructor in Microbiology.*

John F. Flanagan, M.D. (Duke, 1953), *Instructor in Microbiology and Assistant Professor in Medicine.*

H. William Craig, *Technical Associate in Serology.*

Fellows

William Boyle, Ph.D. (Glasgow Univ., 1963), *Research Associate in Immunology.*

Rebecca H. Buckley, M.D. (Univ. of North Carolina, 1958), *Instructor in Pediatrics and Fellow in Immunology.*

Anja Tiilikainen, M.D. (Univ. of Helsinki, 1960), *Fellow in Immunology.*

Edward S. Golub, Ph.D. (Univ. of North Carolina, 1964), *Fellow in Immunology.*

Brack G. Hattler, M.D. (Cornell, 1961), *Fellow in Immunology.*

Peter Hutchin, M.D. (Duke, 1956), *Fellow in Immunology.*

W. H. Prioleau, M.D. (Johns Hopkins, 1962), *Fellow in Immunology.*

Raden Iswara, M.D. (Airlangga Univ., Indonesia, 1964), *Fellow in Microbiology.*

Jae Kyu Chung, M.D. (Kyung Pook Univ., 1949, D.Sc., 1961), *Fellow in Microbiology.*

The required course in microbiology is given in the first term of the second year. An intensive study is made of the common bacteria, fungi, and viruses which cause disease in man. The scope of the laboratory course is reasonably wide and acquaints the student with all the methods and procedures employed in bacteriologic laboratories. Most of the lecture time is devoted to the immunologic and epidemiologic aspects of infection. The instruction is designed to give the students a clear conception of: (1) how organisms gain entrance to the body, (2) the type of poisons which they produce, (3) the nature of the

immune bodies which are produced by the host, and (4) the methods of preventing the disease by active and passive immunization.

The following courses are available as electives for third and fourth year medical students:

Microbial Physiology. A lecture and seminar course devoted to the physiology and comparative biochemistry of micro-organisms. Third quarter. Dr. Burns.

Animal Viruses and Animal Virus Diseases. A seminar course to explore various aspects of virus replication, morphology, immunology and pathogenesis of virus diseases. Fourth quarter. Dr. Osterhout and Dr. Flanagan.

Mycology. A lecture and laboratory course with emphasis on fungi which cause disease in man and animal. Third and fourth quarters. Dr. Conant.

Readings in Bacteriology and Immunology. Selected readings will be assigned students for survey and background information with emphasis on recent classical research in the field which has advanced these areas of biology. First and second quarters. Dr. Smith.

Parasitology. One lecture and three-hour laboratory period per week for eleven weeks. First quarter. Dr. Conant and Dr. Larsh.

Microbiology Seminar. Graduate students and staff meet weekly to discuss and review recent microbiological literature. Throughout the year. All members of the Graduate Staff.

Fundamentals of Immunology. A lecture course on general immunology including the following: Non-specific factors in immunity, nature of antigens and antibodies, antibody production, complement, serological methods, blood groups, autoimmune diseases, tumor, immunity, transplantation immunity, and hypersensitivity. Alternate years, first quarter. Dr. Amos, Dr. Day, Dr. Metzgar, and Dr. Zmijewski.

Advanced Immunology. Genetic control of antigen production, development of antigens in embryogenesis, destruction of antigens in tissue, relationship to differentiation, and aggregation. Theories of antibody formation. Nature of antibodies, combining site, antibodies of similar specificity but different properties, reactivity of antibody fractions. Mechanisms of tolerance and immunological paralysis, split and partial tolerance, immunological enhancement. Cellular immunity and the reactions of circulating and cytrophilic antibody. Homograft injections and autoimmunity and delayed hypersensitivity. Quarter to be determined. Dr. Amos, Dr. Day, Dr. Metzgar, and Dr. Zmijewski.

Methods in Immunology. This is essentially a laboratory course in which the student will learn the following methods of immunology:

agar precipitation, immunoelectrophoresis, direct agglutination, immunofluorescence, complement fixation and passive cutaneous anaphylaxis. Quarter to be determined. Dr. Metzgar and Dr. Zmijewski.

IMMUNOCHEMISTRY. The structure of antibody molecules. The nature of the combining site. The hapten as a molecular probe. Forces involved in antigen-antibody interaction. Specificity, avidity and cross-reaction of antibodies. Purification of antibodies. Antibodies as analytical reagents. Prerequisites: Fundamentals of Immunology or Biochemistry or Physical Chemistry or consent of instructor. Quarter to be determined. Dr. Day.

IMMUNOHEMATOLOGY. A lecture and laboratory demonstration course covering the serological, genetic and anthropological aspects of human blood groups, iso-antigens, and antibodies. Quarter to be determined. Dr. Zmijewski.

ANTIGENIC FACTORS IN GRAFT REJECTION. Production of inbred and coisogenic strains. Mutation and recombination in inbred animals and tumors. Genetic control of histocompatibility iso-antigens in tumors and normal tissues, differential gene action in hybrids and tumors. Antigenic and immunologic factors in homograft rejection, tests for genetic compatibility. Modification of the immune response by genetic or immunologic procedures: tolerance, enhancement, suppression of antigens. Quarter to be determined. Dr. Amos.

CANCER IMMUNOLOGY. An intensive and critical analysis of progress in a major branch of immunological research covering cancer antigens, the tumor-homograft reaction, and the immunotherapy of cancer. Prerequisite: consent of the instructor. Quarter to be determined. Dr. Day.

SEMINAR IN IMMUNOLOGY. Selected topics on various aspects of immunology will be discussed. Seminars will be by students and faculty. Fourth quarter. Dr. Metzgar.

NEUROLOGIC SCIENCES PROGRAM

NEUROLOGIC SCIENCES OPERATING COMMITTEE

Albert Heyman, M.D. (Univ. of Maryland, 1940), *Professor of Neurology and Chairman, Division of Neurology.*

Talmage Peele, M.D. (Duke, 1934), *Professor of Anatomy, Associate Professor of Neurology.*

Ewald Busse, M.D. (Washington Univ., 1942), *Professor of Psychiatry and Chairman of the Department.*

William Wilson, M.D. (Duke, 1947), *Professor of Psychiatry.*

Daniel Tosteson, M.D. (Harvard, 1949), *Professor of Physiology and Chairman of the Department*

Guy L. Odom, M.D. (Tulane, 1933), *Professor of Neurosurgery and Chairman, Division of Neurosurgery.*

Eugene A. Stead, Jr., M.D. (Emory, 1934), *Florence McAlister Professor of Medicine and Chairman of the Department.*

Jerome S. Harris, M.D. (Harvard, 1933), *Professor of Pediatrics and Chairman of the Department.*

F. Stephen Vogel, M.D. (Western Reserve, 1944), *Professor of Pathology.*

William L. Byrne, Ph.D. (Wisconsin, 1953), *Associate Professor of Biochemistry.*

Robert Carson, Ph.D. (Northwestern, 1957), *Associate Professor of Medical Psychology, Assistant Professor of Psychology.*

Staff Members

Neurology

John B. Pfeiffer, M.D. (Cornell, 1942), *Associate Professor of Neurology.*

Irwin A. Brody, M.D. (Pennsylvania, 1956), *Associate in Neurology.*

Stanley H. Appel, M.D. (Columbia Univ., 1960), *Associate in Medicine (Neurology).*

Carl Gerber, Ph.D. (Washington Univ., 1960), *Associate in Neurology and Physiology.*

George W. Paulson, M.D. (Duke, 1956), *Assistant Professor of Neurology.*

Neurosurgery

Blaine S. Nashold, M.D. (McGill, 1954), *Assistant Professor of Neurosurgery.*

George T. Tindall, M.D. (Johns Hopkins, 1952), *Assistant Professor of Neurosurgery.*

Psychosomatic Medicine

Robert F. Klein, M.D. (Alabama, 1955), *Associate in Medicine.*

Morton D. Bogdonoff, M.D. (Cornell, 1948), *Professor of Medicine.*

Neurovascular

Ralph J. Gorten, M.D. (Pennsylvania, 1955), *Associate in Medicine.*

Robert E. Whalen, M.D. (Cornell, 1956), *Assistant Professor of Medicine.*

Neurophysiology

George G. Somjen, M.D. (Univ. of New Zealand, 1961), *Assistant Professor of Physiology.*

Pediatrics

James B. Sidbury, M.D. (Columbia, 1947), *Associate Professor of Pediatrics.*

A. William Renuart, M.D. (Duke, 1956), *Associate in Pediatrics.*

Radiology

John A. Goree, M.D. (Duke, 1955), *Assistant Professor of Radiology.*

Psychology

Irving Diamond, Ph.D. (Univ. of Chicago, 1953), *Professor of Psychology.*

Larry R. Thompson, Ph.D. (Florida State, 1961), *Assistant Professor of Medical Psychology.*

Neuroendocrinology

C. D. Christian, Ph.D., M.D. (Duke, 1958), *Associate Professor of Ob.-Gyn., Director of Gynecological Endocrinology.*

Ophthalmology

W. Banks Anderson, Jr., M.D. (Harvard, 1956), *Assistant Professor of Ophthalmology.*

Physical Therapy

Eleanor M. Flanagan, M.A. (Duke, 1961), *Assistant Professor in Physical Therapy.*

Residents

Joseph W. Stiefel, M.D. (Tennessee, 1958).
Martin A. Hatcher, M.D. (Duke, 1962).
Carvel Gipson, M.D. (Vanderbilt, 1960).
Neil Brown, M.D. (Albany Med. Coll., 1961).
Wesley A. Cook, M.D. (Oregon, 1963).
John P. Kapp, M.D. (Duke, 1962).
Andrew J. Gabor, M.D. (Duke, 1964).

The Neurologic Sciences Program was established to integrate and enlarge the neurologic teaching and research activities in the Medical Center. This Program is an interdisciplinary unit comprised of staff members of several pre-clinical and clinical departments whose interests are specifically related to the various neurologic disciplines. Its purpose is to provide greater learning experiences for the undergraduate student and more comprehensive opportunities for training and research at the graduate level. Although each staff member has his individual teaching and research interests, all participate actively in joint conferences, ward rounds and seminars.

The fundamental orientation of the Neurologic Sciences Program is towards an understanding of the concepts and mechanisms of neurobiology and their particular application to the diseases of man. The brain and nervous system represent an extremely sophisticated and highly differentiated organ system with exquisite control mechanisms influencing general body metabolism and overall behavior. An integrated approach is offered in the study of these complexities and their dysfunctions. It is planned to give the undergraduate and graduate physician an understanding of the problems of clinical neurology as well as to introduce them to research experience which will serve as the foundation for future knowledge. The disciplines of neurochemistry, neurophysiology, neuropathology, and neuroanatomy, with their applications to molecular biology, electrophysiology, and electron microscopy, are available for such investigations.

Resident physicians from the Departments of Medicine, Neurosurgery and Psychiatry are given training in Neurology. Conversely, fellows and house officers in Neurology are assigned to various staff members for training in Neuropathology, Neuroanatomy, Electro-

encephalography, Pediatric Neurology and Neurosurgery. Faculty appointments may be held jointly in the Program of Neurologic Sciences and in other basic science or clinical departments. Teaching ward rounds for students, fellows, and resident physicians are conducted by senior staff members of the Neurologic Science Program five mornings a week at Duke Hospital and the affiliated Veterans Administration Hospital. Out-patient clinics are held twice weekly for follow-up care of patients discharged from the hospital and for treatment of new patients referred from other clinics or outside physicians. An extensive series of teaching conferences or seminars comprise an integral part of undergraduate and postgraduate training.

OBSTETRICS AND GYNECOLOGY

Roy Turnage Parker, M.D. (Med. Coll. of Virginia, 1944), *Professor of Obstetrics and Gynecology and Chairman of the Department.*

Francis Bayard Carter, M.D. (Johns Hopkins, 1925), *Professor of Obstetrics and Gynecology and Chairman Emeritus of the Department.*

Robert Nowell Creadick, M.D. (Yale, 1937), *Professor of Obstetrics and Gynecology.*

Walter Lee Thomas, M.D. (Virginia, 1931), *Professor of Obstetrics and Gynecology*

Walter Boris Cherny, M.D. (McGill, 1950), *Associate Professor of Obstetrics and Gynecology.*

Charles Donald Christian, Ph.D., M.D. (Duke, 1955 and 1958), *Associate Professor of Obstetrics and Gynecology and Director of Endocrine Division.*

W. Kenneth Cuyler, Ph.D. (Duke, 1941), *Associate Professor of Cytology and Anatomy, and Professor of Obstetrics and Gynecology.*

Charles Henry Peete, Jr., M.D. (Harvard, 1947), *Associate Professor of Obstetrics and Gynecology.*

Arthur Chris Christakos, M.D. (South Carolina, 1955), *Assistant Professor of Obstetrics and Gynecology and Director of Infertility Clinic.*

Violet Horner Turner, M.D. (Chicago, 1940), *Assistant Professor of Obstetrics and Gynecology.*

Marion Carlyle Crenshaw, M.D. (Duke, 1956), *Assistant Professor of Obstetrics and Gynecology, and Associate in Physiology.*

Christa von Roebel, M.D., *Associate in Obstetrics and Gynecology.*

George Dewey Wilbanks, Jr., M.D. (Duke, 1956), *Assistant Professor of Obstetrics and Gynecology.*

Louise Kaufmann, A.B. (Univ. of North Carolina, 1947), *Research Associate in Obstetrics and Gynecology.*

Claudius Parks Jones, M.T. (Duke, 1935), *Research Associate in Obstetrics and Gynecology.*

Eleanor Beamer Easley, M.D. (Duke, 1944), *Adjunct Associate Professor of Obstetrics and Gynecology.*

Richard Lehmer Pearse, M.D. (Harvard, 1931), *Adjunct Associate Professor of Obstetrics and Gynecology.*

Trogler Francis Adkins, M.D. (Duke, 1936), *Adjunct Assistant Professor of Obstetrics and Gynecology.*

William Alexander Graham, M.D. (Pennsylvania, 1932), *Adjunct Assistant Professor of Obstetrics and Gynecology.*

Kenneth Arthur Podger, M.D. (Duke, 1941), *Adjunct Assistant Professor of Obstetrics and Gynecology.*

Thomas A. Stokes, M.D. (Duke, 1955), *Adjunct Associate in Obstetrics and Gynecology.*

Roston M. Williamson, M.D. (Med. Coll. of Georgia, 1951), *Adjunct Associate in Obstetrics and Gynecology.*

Francis Norman Bowles, M.D. (Med. Coll. of Virginia, 1924), *Adjunct Instructor in Obstetrics and Gynecology.*

Eleanor Rodwell, M.D. (Temple, 1942), *Adjunct Instructor in Obstetrics and Gynecology.*

Leonard Palumbo, M.D. (Duke, 1944), *Visiting Lecturer in Obstetrics and Gynecology.*

Robert Alexander Ross, M.D. (Pennsylvania, 1922), *Visiting Lecturer in Obstetrics and Gynecology.*

Fellows

Zachariah B. Newton, III., M.D. (Jefferson Med. Coll., 1962).
Lawrence C. Walker, M.D. (Duke, 1960).

Residents

John S. Glover, M.D. (Duke, 1959).
Thomas H. White, M.D. (Duke, 1959).

Assistant Residents

Winnifred Allen Addison, M.D. (Duke, 1960).
Samuel M. Atkinson, Jr., M.D. (Duke, 1961).
Guy Nelson Copeland, Jr., M.D. (Tenn., 1960).
Maurice Nickola Courie, M.D. (Duke, 1959).
Warner Leander Hall, Jr., M.D. (Duke, 1961).
John Stephen Herring, Jr., M.D. (Tulane, 1963).
Harry Carr Huneycutt, Jr., M.D. (Duke, 1961).
Eugene Monroe Long, II, M.D. (Duke, 1963).
Frank Irvin Nicks, Jr., M.D. (Duke, 1962).
Philip Henderson Pearce, M.D. (Duke, 1959).
Carlos Alberto Salcedo, M.D. (Univ. del Valle, 1962).
Robert W. Seaton, M.D. (Tenn., 1960).
Abraham Isaac Sobel, M.D. (Virginia, 1959).
John Benjamin Younger, M.D. (Duke, 1961).
Robert Yowell, M.D. (Duke, 1961).

The first year student receives instruction in the fundamentals of obstetric and gynecologic history and pelvic examination during their course in Introduction to Clinical Medicine.

The second year student spends nine weeks in general obstetrics and gynecology. The student attends lectures, works daily in the general and special out patient clinics and is assigned patients on the obstetric and gynecologic wards. Student sharing in patient care and in teaching exercises is required. Tutorials are held daily with the senior faculty encouraging student participation. Lectures, Clinical Confer-

ences, Gynecologic Pathology Conference, Endocrine Conference, and Correlative Seminars are a part of his learning experience and are outlined below.

LECTURES. For the student who desires didactic, clinically pertinent, information only in order to gain insight into and understanding of the effects of pregnancy, or diseases of the reproductive system, as they relate to his major field of interest. 1 hour 4 times weekly for 9 weeks. Offered throughout the year. Dr. Parker and Staff.

CLINICAL CONFERENCE. Difficult problems in diagnosis and management are presented for consideration and discussion. Current patients, from the wards and the out-patient department, are selected. Course in general obstetrics and gynecology is a prerequisite. 2 hours twice weekly for 9 weeks. Offered throughout the year. Drs. Parker, Carter and Staff.

GYNECOLOGIC CANCER. A survey of malignant disease in the reproductive system. The didactic portion of the course is supplemented by presentations of patients currently in therapy on the wards and in the Gynecologic Cancer Clinic. 3 hours once a week. Offered throughout the year. Drs. Parker and Willbanks.

PATHOLOGY: OBSTETRICAL AND GYNECOLOGICAL. The primary emphasis is upon the gross and microscopic study of the removed tissues of the reproductive system, correlation of the findings with the clinical observations, and consideration of the implications as to the future well-being of the patient. General Pathology is a prerequisite. 1 hour once a week. Offered throughout the year. Dr. Willbanks and Staff.

CORRELATIVE SEMINARS. Exploration in depth of certain specific subjects both within the discipline and from some of the parameters. Discussions and presentations include disorders of other tissues and organ systems, and the influence upon and effects from pregnancy or gynecologic malfunction. 1 hour once a week. Offered throughout the year. Staff and invited faculty.

PREPARATION FOR PRACTICE. For students preparing for: a) General Practice, b) Pediatrics, c) General Surgery, and d) Internal Medicine. In-Patient and Out-Patient duties as an intern in Obstetrics and Gynecology. Special lectures in obstetric management and office gynecology with emphasis on good practice techniques. Full time 18 weeks. Offered throughout the year. Limited to 5 students. Dr. Parker and Staff.

RESEARCH TRAINING. For special students who desire fundamental training in research methodology in Obstetrics and Gynecology. Rotation will be provided through various laboratories. The student, by active participation in investigative projects, learns research techniques

and methods as they apply particularly in Endocrinology, Cytogenetics, Cytology, Bacteriology, Chemotherapy, Maternal and Fetal Physiology, Toxemia and others. Full time 18 weeks. Limited to 14 students. Offered throughout the year. Dr. Parker and Staff.

The Infertile Couple. A didactic and clinical study of infertility in the human. Assigned reading of pertinent medical literature, both historical and current, is correlated with clinical observation in patients. The student is made familiar with testing techniques and the use of the required apparatus and instruments, and participates in the treatment of patients. 3 hours twice weekly for 9 weeks. Offered throughout the year except summer quarter. Limited to two students. Drs. Peete and Christakos.

Human Embryology. For the student who desires a study of human growth and development in utero. In addition to assigned reading and lectures, pertinent gross and microscopic material shall be studied. Incorporates Developmental Anatomy, Physiology, Biochemistry and, as available, Developmental Pathology. 2 hours twice weekly for 9 weeks. Offered twice a year, Fall and Spring Quarters. Limited to 6 students. Dr. Cherny.

Genital Cytology. A comprehensive survey of clinical genital cytology. Special instruction is provided in preparation of material and interpretation of cytologic appearances. The general cytology library contains adequate resource material and current patient slides for study. 3 hours twice a week, for 9 weeks. Offered twice a year, Fall and Spring Quarters. Limited to 4 students. Dr. Cuyler and Miss Kaufmann.

Gynecologic Bacteriology. Work in the Clinical Laboratory of Gynecologic Bacteriology is carried out to provide a basic knowledge of special techniques in aerobic and especially in anaerobic culture. Correlation is made with clinical findings in patients with gynecologic infections. Participation in basic research is expected. 4 hours twice weekly for 9 or 18 weeks. Offered twice a year, Fall and Winter Quarters. Limited to 4 students. Dr. Carter and Mr. C. P. Jones.

Research Preceptorships. By individual arrangement with the faculty. Although research project assignments are the major undertaking, emphasis is maintained on the clinical implications and applications of the research.

Clinical Preceptorships. Primary emphasis on clinical applications of patient care. Teaching is done with current patients. Ambulatory treatment, ward rounds, operating room and delivery room experience is provided. By individual arrangement with faculty.

Endocrinology Seminar (Depts. Ob-Gyn, Medicine, and Pediatrics): Once-weekly sessions of one hour each with discussion of inter-


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esting clinical problems and related clinical and basic research. Dr. Christian from Ob-Gyn Dept. plus other members of divisions of Endocrinology. Taught throughout the year.

Clinical Endocrinology. Elective course for student who desires additional clinical instruction in examination, diagnosis and treatment of obstetric and gynecologic patients with endocrinopathy. Course consists of examination and treatment of patients in the Endocrinology Out-Patient Clinic. 2 half days a week (4 hours each day). Taught throughout the year. Dr. Christian and Staff and Fellows of Endocrine Division.

Neuroendocrinology. Provides laboratory exposure in the current methods of neuroendocrine investigation, including stereotoxic stimuli and lesions, isotope localization, and immunochemistry of the ovulation-inducing hormones as well as rounds on those endocrine patients pertinent to the topic. One 9-week course. Full time. Any quarter by special arrangement. Dr. Christian.

Cytogenetics. For student who desires experience in depth of the genetic basis of disease. Course includes clinical studies as well as basic steps and procedures in cytogenetic research. 8 hours per week. Taught twice yearly, Summer and Winter Quarters. Limited to 4 students. Dr. Christakos.

Developmental Biology. This course will represent a joint endeavor by the Departments of Obstetrics and Pediatrics with the help of members from the Department of Anatomy, Biochemistry, Pathology, and Physiology. The student will explore problems of fertility and sterility, ovulation and implantation, placental transfer, fetal physiology and biochemical differentiation, and perinatal events and postnatal development. Examples for discussion will be drawn from the clinical material on the wards of Duke Hospital. Full time, nine weeks. Drs. Crenshaw and Harris.

Clinical Problems in Maternal-Fetal Interaction. An obstetric-pediatric study of factors concerning the mother and infant during pregnancy, labor, delivery, and the first month of life. Emphasis will be placed on teratogenic influences, abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely afflicting the fetus and newborn in the prenatal area, and hospital and early house management of the infant, especially as related to parent-child adjustments. When possible, a family will be followed during the pregnancy and throughout the first month of the infant's life. Available to five students. Full time, nine weeks. Drs. Crenshaw and Harris.

PATHOLOGY

Thomas D. Kinney, M.D. (Duke, 1937), *Professor of Pathology and Chairman of the Department.*

Wiley D. Forbus, M.D. (Johns Hopkins, 1923), *Professor of Pathology and Chairman Emeritus of the Department.**

Donald B. Hackel, M.D. (Harvard, 1946), *Professor of Pathology.*

Nathan Kaufman, M.D. (McGill, 1941), *Professor of Pathology.*

Janis V. Klavins, M.D. (Univ. of Kiel, 1948; Ph.D., 1959), *Professor of Pathology.*

F. Stephen Vogel, M.D. (Western Reserve, 1944), *Professor of Pathology.*

Bernard F. Fetter, M.D. (Duke, 1944), *Associate Professor of Pathology.*

Stanley M. Kurtz, M.D. (Alabama, 1958), Ph.D (George Washington, 1953), *Associate Professor of Pathology.*

Albert G. Smith, M.D. (Washington Univ., 1947), *Associate Professor of Pathology.*

Jacinto J. Vazquez, M.D. (Univ. of Havana, 1948), *Associate Professor of Pathology.*

Jane G. Elchlepp, M.D. (Chicago, 1955), Ph.D. (Iowa, 1948), *Assistant Professor of Pathology.*

A. Wendell Musser, M.D. (Indiana University, 1956), *Assistant Professor of Pathology and Chief of Laboratory Services, VA Hospital.*

Joachim R. Sommer, M.D. (Munich, 1950), *Assistant Professor of Pathology.*

Harvey J. Sage, Ph.D. (Yale, 1958), *Assistant Professor of Pathology and Assistant Professor of Biochemistry.*

Benjamin Wittels, M.D. (Minnesota, 1952), *Assistant Professor of Pathology.*

Beulah M. Ashbrook, M.T. (A.S.C.P.), M.S. (Duke, 1964), *Associate in Medical Technology and Registrar, School of Medical Technology.*

Glen R. Gale, Ph.D. (Duke, 1952), *Associate in Pathology and Associate in Pharmacology.*

William W. Johnston, M.D. (Duke, 1959), *Associate in Pathology.*

Gordon K. Klintworth, M.D. (Univ. of Witwatersrand, 1957), *Associate in Pathology.*

Corpus O. Ortigoza, M.D. (Baylor, 1959), *Associate in Pathology.*

Ivan L. Peacocke, M.D. (Vanderbilt, 1958), *Associate in Pathology.*

Martha D. Vazquez, M.D. (Univ. of Havana, 1948), *Associate in Pathology.*

Carl M. Bishop, *Technical Associate in Pathology.*

Peteris Kalnins, *Technical Associate in Cytology.*

J. Phillip Pickett, *Technical Associate in Pathology.*

William Jurgelsky, Jr., Ph.D. (Rutgers, 1958), *Research Associate.*

Fellows

Joseph D. Balentine, M.D. (Med. Coll. of South Carolina, 1963), *Fellow in Neuropathology.*

Barrett W. Dick, M.D. (Washington Univ., 1963), *Fellow in Pathology.*

Michael H. Fronstin, M.D. (Duke, 1964), *Fellow in Pathology.*

Donald J. Kroe, M.D. (Duke, 1963), *Fellow in Pathology.*

Arthur M. Martin, Jr., M.D. (Duke, 1961), *Fellow in Pathology.*

Jackson H. McCarter, M.D. (Univ. of Pittsburgh, 1963), *Fellow in Pathology.*

* Retired August 31, 1964.

Residents

Charles C. Barringer, M.D. (Jefferson Med. Coll., 1946), *Assistant Resident.*
Charles Binford, M.D. (Virginia, 1959), *Assistant Resident.*
Robert R. Cole, M.D. (Univ. of Arkansas, 1961), *Assistant Resident.*
Ronald Crown, M.D. (George Washington, 1962), *Assistant Resident.*
Herbert J. Gerber, M.D. (Univ. of Pennsylvania, 1961), *Assistant Resident.*
W. J. Kirsch, M.D. (Georgetown, 1961), *Assistant Resident.*
Michael H. Leakan, M.D. (Univ. of Maryland, 1960), *Assistant Resident.*
John B. Otis, M.D. (Vanderbilt, 1962), *Assistant Resident.*
Safik F. Richany (Univ. of Wisconsin, M.D., 1957; Ph.D., 1955), *Assistant Resident.*
Joseph H. Riddick, Jr., M.D. (Duke, 1963), *Assistant Resident.*
Bruce M. Schlein, M.D. (State Univ. of New York—Downstate Medical Center, 1963), *Assistant Resident.*
Edward J. Starinchak, M.D. (Ohio State, 1963), *Assistant Resident.*
Lawrence A. Taylor, M.D. (Univ. of North Carolina, 1963), *Assistant Resident.*

Interns

Suzanne Butcher, M.D. (Duke, 1964).
Roderick L. Guerry, Jr., M.D. (Med. Coll. of Georgia, 1964).
James B. Powell, M.D. (Duke, 1964).
Jack V. Rozwadoski, M.D. (Hahneman Med. Coll., 1964).
Abe Walston, M.D. (Duke, 1963).
Jacqueline H. Werner, M.D. (Georgetown, 1964).

The required course in pathology is given during the second term of the first year. The fundamentals of pathology are presented to the student by a correlated study of gross and microscopic material illustrating the structural changes in disease. Lectures developing broad concepts of disease processes are given by the members of the senior staff. Conferences with small groups of students under the guidance of a staff member are scheduled for purposes of more intimate discussion. The emphasis is placed on etiology and pathogenesis of disease and the experimental approach to an understanding of disease. Animal experiments performed either by students or by demonstrators are used to correlate functional and structural changes in disease. The group work is supplemented by weekly conferences involving the class as a whole and dealing with problems presented by current autopsies and with other problems of general importance. Student collaboration in post-mortem studies is required. Cases thus studied are presented by the student before the class under the direction of the staff; this takes the form of a clinical-pathologic conference in which each student plays a particular role.

The Pathologic Basis for Clinical Medicine. The study of disease will be approached by an examination of the pathologic processes as these affect the various systems and organs. An attempt will

be made to orient the student in special pathology and to help him crystallize and apply the basic knowledge that he has acquired in the prerequisite pathology course. The course will be organized with lectures, laboratories, and experimental demonstrations. Clinical pathologic correlations, including correlation with radiologic findings, will be stressed. The case method of teaching will be emphasized and material from current and past autopsies utilized. The systems to be covered are the cardiovascular system, endocrine, respiratory, gastrointestinal, genito-urinary, female genital, hematopoietic, bones and joints, neuromuscular, organs of special sense, and skin. Prerequisite: Pathology. Four hours, three times a week. Quarter to be determined. Dr. Kaufman and Staff.

Basic Problems in Cardiovascular Pathology. This is an advanced course in diseases of the cardiovascular system with particular emphasis on the heart. A seminar-tutorial system will be used to explore physiological expressions of morphological abnormalities of the heart. Specific problems in heart disease and experimental approaches toward solution of the problems will be discussed and dealt with. Two hours, once weekly. Limited to six students. To be given once a year. Quarter to be determined. Dr. Wittels.

Advanced Neuropathology. Students will receive personal supervision in a detailed study of gross and microscopic neuro- and ophthalmologic pathology and in a review of neuroanatomy. They will assume limited responsibility for the performance of post-mortem examinations upon patients with neurologic diseases. Opportunities will be provided for an introduction into research methods, notably electron microscopy, as utilized in investigations of the nervous system. Limited to two students full time, twice a year. Quarter to be determined. Dr. Vogel, Dr. Klintworth and Staff.

Introduction to Immunopathology. This course is designed primarily for students planning to pursue postgraduate training in Pathology. The student is considered a full time research fellow and will perform selected experiments in which he will utilize techniques of immunochemistry, immunohistochemistry and morphology. In addition, the student will have the following scheduled appointments, twice a week: a) formal lecture; b) group discussion with staff; c) gross and microscopic morphology of selected human cases with immunopathologic conditions. The student will be given adequate time for library research and preparation of assigned topics for verbal and written presentations. Full time—once a year. Limited to four students. Quarter to be determined. Dr. Vazquez and Staff.

Exfoliative Cytology. This course will include study of available cells from various sources for diagnostic purposes. The identifica-

tion of cell type, structure, and function will be done by applying various physical and chemical methods. Concomitant histological studies will be carried out. Particular emphasis will be given to diagnosis of malignant neoplasms. Experimental work and reviews of literature will be utilized as part of the study in this course. Four hours, three times weekly. To be given once a year. Limited to three students. Quarter to be determined. Dr. Klavins and Staff.

Obstetrical and Gynecological Pathology. This course is designed for the student who is oriented toward obstetrics and gynecology. Classroom work in the first seven weeks will include a coverage of all diseases involving the pregnant and non-pregnant female genital tract. The last two weeks of the course will be devoted to the practical application of the acquired knowledge through the study of current materials. Two days of study will be devoted to exfoliative cytology of the female genital tract. The student will be expected to participate actively in all phases of the course. Four hours, three times a week. Limited to five students. Quarter to be determined. Dr. Fetter.

Neoplastic Disease. Theoretical problems and concepts in neoplasia will be considered. The pathogenesis of certain types of tumor will be studied and consideration will be given to etiologic factors such as genetic, viral, physical and chemical. The influence of chemotherapeutic agents on neoplasia, both at the cellular and sub-cellular level, will be studied. Seminars and lab periods. Four hours, twice a week. Quarter to be determined. Dr. Kinney and Dr. Klavins.

Pulmonary Pathology. This course is designed for students with an interest in pulmonary disease. The various diseases of the lung, neoplastic, infectious, and others, will be evaluated in relation to pathogenesis and etiology. Anatomic alteration will be correlated with functional incapacity and with the clinical findings. Four hours, once weekly. Quarter to be determined. Dr. Kinney and Staff.

Pediatric Pathology. This course is designed to serve the interests and the needs of the students interested in pediatrics. A wide range of diseases associated primarily with pediatric patients will be studied. An attempt will be made to correlate pathological findings with the clinical picture. Four hours, once a week. Quarter to be determined. Staff.

Histochemistry and Cytochemistry. A wide range of histochemical and cytochemical observations in cells will be correlated with basic biochemical intracellular processes and the localization of these processes. The qualitative and quantitative alterations in the cells seen in disease states will be studied. The methods utilized in this course will be taught to students who will be expected to carry out the observations on materials which they have prepared themselves. Four hours,

once a week. Limited to three students. Quarter to be determined. Staff.

Electron Microscopy in Pathology. This course is presented for those students who wish to broaden their basic knowledge of cellular structure and cellular pathology. Formal instruction will be designed to: 1) explain basic electron microscopic technique: its advantages and its limitations; 2) to interpret the rapidly accumulating body of electron microscopic studies in the literature; and 3) to review the areas where electron microscopy has made significant contributions to our understanding of pathology. The resources of the laboratory will be available to demonstrate the techniques of specimen preparation and the operation of the electron microscope. The students will have the opportunity to prepare and examine clinical or experimental pathologic material already on hand and to apply the information obtained through formal instruction. Seminars will be held to involve the students with their subject in depth. Two hours, twice a week. Limited to two students. Quarter to be determined. Staff.

Pathology of the Gastrointestinal System. This course will explore the diseases of the gastrointestinal system, including diseases of the liver and pancreas, in greater depth and breadth than available in other courses. A wide range of diseases of this system will be reviewed, and pathologic changes will be correlated with clinical findings and physiological and biochemical processes. Collected material available in the department and current material from the autopsy service will be utilized. Material from surgical pathology will be used as it becomes available and the findings will be correlated with the clinical symptoms manifested by the patients on the ward. Diseases covered will be congenital, nutritional, neoplastic, infectious, and metabolic. Seminar and group teachings will be combined with laboratory periods. Two hours weekly. Limited to four students. Quarter to be determined. Dr. Klavins and Staff.

Cellular Pathology. The subject and the objectives of this course will be introduced by a historical review followed by detailed demonstration, discussion, and, in the laboratory period, selected application of methods of investigation in cellular pathology. Subsequently, the structural equivalent in individual cells of the injured function of total organs will be discussed. The final portions of the course will be devoted to the specific cellular pathology of viral, neoplastic, and other selected diseases as well as to diagnostic cytology. Two hours, twice a week. Limited to six students. Quarter to be determined. Dr. Sommer.

Autopsy Pathology. The students will work directly with one of the members of the Pathology Staff. They will first assist at autopsies and then perform a few selected autopsies. The emphasis will be on a

very careful study of a small number of cases, selected to exemplify important pathologic processes. The examination of cases will include correlated reference to other cases on file in the department and to appropriate current and old literature. Full time. Offered all year around. Limited to four students. Staff.

Cardiovascular Pathology. This course will stress clinical correlation with pathologic problems in the cardiovascular system. The normal anatomy and embryology of the cardiovascular systems will be reviewed, including a consideration of the normal and abnormal conducting system and electrocardiogram. The various disease processes will be studied in detail, utilizing gross and microscopic specimens, examination of patients with similar diseases, and consideration of laboratory diagnostic techniques. Three hours, once a week. Limited to twelve students. Quarter to be determined. Dr. Hackel and Staff.

Problems of Abnormal Growth and Development. A survey of experimental studies of genetic, chemical, and physical factors related to disorders of development and growth with review of normal embryonic and fetal development; induction and organizers; cellular differentiation and interaction; development arrest, mechanism of action and specificity of teratogenic agents. Two hours per week as seminar group. Each student to meet instructor individually for one hour tutorial per week. Limited to five students. Quarters to be determined. Dr. Elchlepp.

Methods of Study of Abnormal Growth and Development. Laboratory techniques in experimental embryology and teratology, including demonstrations of dependent differentiation, induction of malformations, production of chromosomal abnormalities, and karyotyping. Limited to five students. To meet as one three-hour laboratory period per week for nine weeks. Three hours per week. Quarters to be determined. Prerequisite: Concurrent enrollment in Problems in Abnormal Growth and Development. Dr. Elchlepp.

Research in Pathology. Independent research projects in the various fields of pathology. Time and credit to be arranged. Dr. Kinney and Staff.

Laboratory Medicine. This course will give the student understanding of the theoretical and practical bases of various laboratory procedures. Methodology and sources of error will be considered, and correlations made between laboratory findings and physiologic and biochemical alterations in disease processes and in various disease states. The shortcomings and the benefits derived from the rational and critical utilization of laboratory procedures will be emphasized. This course

will act as a bridge between the basic science and clinical science disciplines. The student will learn to evaluate present tests and procedures and their modifications and will learn to evaluate critically new procedures as they evolve and develop. The knowledge obtained previously in biochemistry, pathology, hematology, and microbiology will be drawn upon heavily in this course. The teaching techniques utilized will be seminars, tutorials, laboratory periods, and visits to the wards. Limited to four students. Four hours, twice a week. Quarter to be determined. Dr. Musser and Staff.

Pathology of the Bones, Joints, and Related Structures. The various diseases of the bones and joints will be reviewed and studied. The course will be structured around seminars and laboratory periods when gross and microscopic material will be studied. Emphasis will be placed on the natural history of the lesion, pathogenesis, and correlation with roentgenographic, clinical, and laboratory findings. Two hours, once a week. Quarter to be determined. Staff.

Pathology of Urinary and Male Genital Systems. The main purpose of this course will be the detailed study of diseases of the urinary and male genital systems, correlating basic science, pathologic, and clinical aspects. The normal anatomy, embryology, and physiology of the kidney will be reviewed, and various congenital, inflammatory, neoplastic, toxic, and hypersensitivity renal diseases will be studied. Gross and microscopic specimens will be available and will be correlated with practical patient problems. A similar approach will be followed for the male genital system. A few selected animal demonstrations of pathologic processes will be performed, permitting some experience with immunopathologic and electron microscopic problems. Three hours, once a week. Limited to twelve students. Quarter to be determined. Dr. Hackel and Staff.

Surgical Pathology. This course is designed for the student who wishes more experience in the study of disease. Although the course is entitled Surgical Pathology, this does not imply interest solely in the individual oriented to surgery. Examination of all tissues removed will be performed so that problems in dermatology, gynecology, orthopedics, general surgery, internal medicine, etc., will be considered. The primary emphasis will be upon study of the removed tissues and correlation of these findings with the clinical observations. Each day's work will consist of three parts: 1) study of gross material; 2) study of microscopic sections; and 3) ward rounds. Four hours—five times a week for one quarter. To be given twice a year, quarters to be determined. Limited to five students. Dr. Fetter and Dr. Smith.

PEDIATRICS

Jerome Sylvan Harris, M.D. (Harvard, 1933), *Professor of Pediatrics, Chairman of the Department, and Associate Professor of Biochemistry.*

Wilburt Cornell Davison, M.D. (Johns Hopkins, 1917), *James B. Duke Professor of Pediatrics Emeritus.*

Jay Morris Arena, M.D. (Duke, 1932), *Professor of Pediatrics.*

Daniel Cady Darrow, M.D. (Johns Hopkins, 1920), *Adjunct Professor of Pediatrics.*

Susan Coons Dees, M.D. (Johns Hopkins, 1934), *Professor of Pediatrics.*

Angus M. McBryde, M.S. (Pennsylvania, 1927), *Professor of Pediatrics.*

William J. A. DeMaria, M.D. (Duke, 1948), *Associate Professor of Pediatrics and Professor of Preventive Medicine.*

F. Stanley Porter, M.D. (Johns Hopkins, 1952), *Associate Professor of Pediatrics.*

James Buren Sidbury, Jr., M.D. (P & S, Columbia, 1947), *Associate Professor of Pediatrics and Director, Clinical Research Unit.*

Madison Stockton Spach, M.D. (Duke, 1954), *Associate Professor of Pediatrics.*

Robert S. Stempfel, Jr. M.D. (Vanderbilt, 1952), *Associate Professor of Pediatrics and Assistant Professor of Physiology.*

Samuel O. Cornwall, M.D. (Univ. of Minnesota, 1955), *Assistant Professor of Pediatrics.*

John A. Fowler, M.D. (Bowman-Gray, 1946), *Assistant Professor of Pediatrics and Professor of Psychiatry.*

Harold J. Harris, M.D. (Long Island Coll. of Med., 1949), *Assistant Professor of Pediatrics and Associate Professor of Psychiatry.*

Leslie B. Hohman, M.D. (Johns Hopkins, 1917), *Assistant Professor of Pediatrics and Professor of Psychiatry Emeritus.*

Arthur Hill London, M.D. (Pennsylvania, 1927), *Assistant Professor of Pediatrics* (Duke) *and Clinical Professor of Pediatrics* (UNC).

Hans Lowenbach, M.D. (Hamburg, 1929), *Assistant Professor of Pediatrics and Professor of Psychiatry.*

Alexander Spock, M.D. (Univ. of Maryland, 1955), *Assistant Professor of Pediatrics.*

Talmage L. Peele, M.D. (Duke, 1934), *Assistant Professor of Pediatrics, Professor of Anatomy, and Associate Professor of Neurology.*

George A. Engstrom, M.D. (Duke, 1959), *Associate in Pediatrics.*

James David Jones, M.D. (Duke, 1954), *Associate in Pediatrics and Assistant Professor of Psychiatry.*

E. Croft Long, M.B., B.S., Ph.D. (Univ. of London, 1952 & 1957), *Associate in Pediatrics, Associate Professor of Physiology, and Assistant Dean, Duke University School of Medicine.*

Adhemar W. Renaurt, M.D. (Duke, 1956), *Associate in Pediatrics.*

George A. Watson, Jr., M.D. (Duke, 1939), *Associate in Pediatrics.*

J. Street Brewer, M.D. (Jefferson, 1919), *Instructor in General Practice.*

Amos N. Johnson, M.D. (Pennsylvania, 1933), *Instructor in General Practice.*

Thomas T. Jones, M.D. (Johns Hopkins, 1932), *Instructor in General Practice.*

Harriette Amey, A.B. (North Carolina Coll., 1944), *Instructor in Pediatric Social Service.*

Rebecca Hatcher Buckley, M.D. (Univ. of North Carolina, 1958), *Instructor in Pediatrics.*

Ramon V. Canent, Jr., M.D. (Univ. of Santo Tomas, Philippines, 1957), *Research Instructor in Pediatrics.*

Frederick T. Eastwood, M.D. (Temple, 1944), *Instructor in Pediatrics.*

Norbert B. Enzer, M.D. (McGill, 1956), *Instructor in Pediatrics and Resident in Psychiatry.*

William W. Farley, M.D. (Med. Coll. of Virginia, 1942), *Instructor in Pediatrics.*

David A. Lockhart, M.D. (Duke, 1951), *Instructor in Pediatrics.*

William L. London, M.D. (Univ. of North Carolina, 1955), *Instructor in Pediatrics.*

Charles B. Neal, III, M.D. (Duke, 1955), *Instructor in Pediatrics.*

Shirley Kirkman Osterhout, M.D. (Duke, 1957), *Instructor in Pediatrics.*

A. Douglas Rice, M.D. (Duke, 1951), *Instructor in Pediatrics.*

Dorothy B. Shearin, M.D. (Woman's Med. Coll. of Pennsylvania, 1954), *Instructor in Pediatrics.*

Benjamin S. Skinner, M.D. (Washington, 1940), *Instructor in Pediatrics.*

Bailey Webb, M.D. (Duke, 1946), *Instructor in Pediatrics.*

Fellows

Thomas H. Albertson, M.D. (Duke, 1959), *Fellow in Pediatric Allergy.*

Abdul-Aziz Asadi, M.D. (Duke, 1958), *Fellow in Pediatric Endocrinology.*

John P. Boineau, M.D. (Duke, 1959), *Fellow in Pediatric Cardiology.*

Vishnu Jain, M.D. (Agra Med. Coll., India, 1952), *Fellow in Pediatric Cardiology.*

Elizabeth A. Lamb, M.D. (Univ. of Tennessee, 1958), *Fellow in Pediatric Endocrinology and Instructor in Pediatrics.*

Aaron R. Levin, M.D. (Witwatersrand Univ. Med. Sch., 1953), *Fellow in Pediatric Cardiology.*

Bagher Sheikholislam, M.D. (Univ. of Teheran, 1958), *Fellow in Pediatric Endocrinology.*

Harry A. Whitaker, Jr., M.D. (Duke, 1956), *Fellow in Pediatric Allergy.*

Residents

William C. Cooper, Jr., M.D. (Duke, 1960).

Cecil Lee Gilliatt, Jr., M.D. (Harvard, 1962).

Margaret Jane Willhide, M.D. (Med. Coll. of Virginia, 1962).

Senior Residents

Martha Ann Claxton, M.D. (Univ. of Virginia, 1961).

Paul H. Jewett, M.D. (Stanford, 1962).

Shannon Nelson Weston, M.D. (Med. Coll. of South Carolina, 1962).

Assistant Residents

Charles R. Ayers, M.D. (Duke, 1963).

Joseph Owen Hendley, M.D. (Pennsylvania, 1963).

John Roger Hogg, M.D. (Med. Coll. of Virginia, 1963).

Lee William McLain, Jr., M.D. (Duke, 1961).

Malcolm Henderson Rourk, Jr., M.D. (Pennsylvania, 1963).

Donald D. Smith, M.D. (Duke, 1960).

Charles Hunter VonCanon, M.D. (Univ. of Tennessee, Dec. 1962).

Junior Assistant Residents

Ralph L. Bentley, M.D. (Univ. of North Carolina, 1960).

Luis Galvez Duque, M.D. (Univ. of San Carlos, Guatemala, 1962).

Ming-liang Lee, M.D. (National Taiwan Univ. Coll. of Med., 1962).

Interns

Johnnie L. Gallemore, Jr., M.D. (Emory, 1964).
John Howland Hall, M.D. (Duke, 1964).
Bruce Stone Keenan, M.D. (Pennsylvania, 1964).
Kay Riffle Lewis, M.D. (Duke, 1964).
Charles R. Roe, M.D. (Duke, 1964).
William Beal Scroggie, M.D. (Southwestern Med. Sch., 1964).
Nathan Philip Strause, III, M.D. (Duke, 1964).
Albert J. Strauss, Jr., M.D. (Univ. of Virginia, 1964).
Larry Kent Totten, M.D. (Duke, 1964).

The basic course in pediatrics consists of seven weeks during the second year, the time being equally divided between clinic and ward services. Students participate in the morning subspecialty clinics, the well baby clinics, and afternoon general medical pediatric clinics, seeing both new and return patients. Each week, a one-hour conference is held at the end of the following specialty clinics: hematology, metabolism, neurology, cardio-renal, allergy, convulsive disorders, behavior problems, endocrinology, and well baby care. Each afternoon, there is a one-hour conference in the general pediatric clinic with informal presentation and discussion of patients. On the wards, the students assist as clinical clerks and are assigned patients in rotation. They make daily rounds with the staff. Pediatric nursing procedures are demonstrated by the nursing supervisor. The different subspecialty groups—cardiology, hematology, allergy, endocrinology, dermatology, metabolism—make ward rounds weekly. A joint conference with the senior and resident staff is held twice weekly on topics of pediatric interest, clinicopathologic discussions, case presentation, and for guest lecturers. There is a weekly radiology conference at which the interesting cases of the week are presented and discussed with the radiologist. Each student prepares a paper on a pediatric subject of his own choosing which they present to the entire group in an informal discussion.

General Pediatrics. The student will be assigned to the wards, clinics, and newborn nursery according to his interest and goals. In general, he will have an apprenticeship in pediatrics with learning experiences stemming directly from the patient and his problems. Ten students. Full time, 9 weeks. Given every quarter. Dr. Harris and Staff.

Pediatric Neurology and Convulsive Disorders. The student will examine and discuss patients with neurological and convulsive disorders in the wards and clinics of Duke Hospital and in the in-patient facilities of the Murdoch Center. In Dr. Renuart's laboratory at the Murdoch Center, he will learn the techniques and significance of various screening tests for metabolic disturbance causes of mental retardation

and convulsive disorders. Limited to two students. Full time, first and third quarters. Dr. Renuart and Staff.

Mental Retardation. Survey of medical, psychological, social, and special educational aspects of mental retardation, including clinic evaluation and management approaches. Utilization of existing neurologic, endocrinologic, and child guidance clinic facilities, and field work at the Murdoch Center. Limited to three students. Full time, second and fourth quarters. Dr. Renuart, Dr. Engstrom, and Staff.

Pediatric Cardiovascular Disease. An interdisciplinary type of elective will be available in Cardiovascular Disease involving the Departments of Medicine, Surgery and Pediatrics. Two thirds of the elective will be spent in clinical areas with close patient contact. An integrated approach will allow the student to work-up the patient on admission, participate in special diagnostic studies (e.g., cardiac catheterization), follow the patient to the operating room, and then participate in post-operative care. Students may elect, within the program, to spend the major portion of their time in the areas of surgical cardiology, adult medical cardiology, or pediatric cardiology. Several weekly conferences will be attended by all students on the elective in Cardiovascular Disease. One third of the elective time may be spent in special areas, such as electrocardiography, experimental surgery, or research. Since each student in the Cardiovascular elective will be primarily responsible to a senior staff person in one of the three areas (cardiac surgery, adult medicine, or pediatric cardiology), it is anticipated that an active interchange of ideas will prove to be a strong catalyst for the student to view cardiovascular disease as it occurs in all age groups, to obtain a concept of methodology and diagnosis, and to envision an approach to medical and surgical therapy. Each student will be primarily under the supervision of one Division (e.g., Medical Cardiology, Cardiac Surgery or Pediatric Cardiology). Limited to five students. Full time, all quarters. Dr. Spach and Staff.

Pediatric Endocrinology. The elective program in pediatric endocrinology will allow the student broad exposure to clinical endocrine material through active participation in the operation of the Pediatric Endocrine Clinic and certain non-pediatric endocrine clinics within the Endocrine Division. Students will become acquainted with the techniques of metabolic studies performed on the Clinical Research Unit when patients with hormonal disturbances are available for investigation. During the elective period, particular stress will be placed upon the application of methods of hormone assay and steroid measurement to the diagnosis of endocrine disorders in childhood. A series of biweekly endocrine seminars (one clinical and one basic) will be conducted for students, assigned house staff, and fellows. In addition, participants will attend the regular conferences, seminars and ward

rounds of the Endocrine Division. Limited to four students. Full time, second and third quarters. Dr. Stempfel and Staff.

Allergy and Pulmonary Diseases. An intensive course in the clinical evaluation, diagnosis, and treatment for all types of allergic problems in children such as eczema, asthma, allergic rhinitis, urticaria, food, drug, bacterial allergies, collagen, autoimmune diseases and immunological abnormalities. The clinical work is amplified by laboratory experiences, skin testing procedures, pollen identification, preparations of allergens, allergy vaccine, and appropriate immunologic tests. Students will see numerous patients with chronic lung disease, especially cystic fibrosis of the pancreas, and will utilize pulmonary function tests and blood gas analyses as they apply to the respective patients. The students will have an opportunity to see how other medical specialties such as Dermatology, ENT, Psychiatry, Endocrinology, Physiology, Physical Therapy, and Inhalation Therapy relate to the various allergic problems. Limited to six students. Full time, all quarters. Dr. Susan Dees and Dr. Spock.

Developmental Biology. This course will represent a joint endeavor by the Departments of Obstetrics and Pediatrics with the help of members form the Departments of Anatomy, Biochemistry, Pathology, and Physiology. The student will explore the problems of fertility and sterility, ovulation and implantation, placental transfer, fetal physiology and biochemical differentiation, perinatal events and early postnatal development. Examples for discussion will be drawn from the clinical material on the wards of Duke Hospital. Limited to three students. Full time, second and fourth quarters. Dr. Harris and Dr. Christian.

Metabolic Disorders. The course will be open to students, preferably those who have or wish to start a laboratory project. The project may be in any laboratory but must have a bearing on normal or abnormal metabolism. There will be assigned reading, weekly seminars, weekly rounds in conjunction with interdepartmental groups interested in metabolic disorders, and duties in relation to in-patients and outpatients with metabolic disorders. Full time, each quarter. Limited to two students. Dr. Sidbury.

Pediatric Hematology. The course will include all aspects of clinical and laboratory pediatric hematology with emphasis on fundamental concepts as related to hematologic disorders. There will be daily ward rounds, a weekly clinic, weekly slide conferences, weekly seminars, as well as assigned reading. Students will be encouraged to engage in some individual clinical or laboratory project during the period of the course. Limited to two students. Full time, all quarters. Dr. Porter.

Clinical Problems in Maternal-Fetal Interaction. An Obstetric-Pediatric study of factors concerning the mother and infant during pregnancy, labor, delivery, and the first month of life. Emphasis will be placed on teratogenic influences, abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely afflicting the fetus and newborn, and early management of the infant, especially as related to parent-child adjustments. When possible, a family will be followed during the pregnancy and through the first month of the infant's life. Limited to five students. Full time, first and third quarters. Dr. Christakos and Dr. McBryde.

Poison Control Center. The student will participate in all functions of the Center. He will be on-call for the treatment of these cases in the Emergency Room or ward and will help compile the monthly data, discussing each report with the Director. Seminars will be arranged with the Director and appropriate members of the University faculty (pharmacology, pathology, biochemistry). Limited to three students. Full time, first quarter. Dr. Arena.

Preceptorship in General Pediatrics. The student will spend several days each week with selected practicing pediatricians or a group of associated pediatricians in Durham. He will participate in daily newborn-premature rounds at Duke and Watts Hospital, conduct well-baby conferences in the town of Durham and at Duke, and attend prenatal conferences and clinics with emphasis on observation of abnormal pregnancy. The aim of this course is to give the student insight into the management of well and ill children in an atmosphere which will prevail when he enters practice. Limited to three students. Full time, all quarters except summer. Dr. Arena, Dr. McBryde and Staff.

Newborn and Premature Infants. Students will have intensive experience in the newborn and premature nurseries. Included will be discussions of prenatal hazards, resuscitation, care of the normal newborn and premature infant, and pathological and normal psychological conditions occurring in the newborn and their treatment. Emphasis is placed on the initiation of parent-child relationships, and of breast feeding. Limited to nine students. Full time, all quarters except summer. Dr. McBryde.

Behavioral Aspects of Pediatric Illness. The students experience with children will include the impact on the family as well as the psychic and somatic adjustment of the child. Limited to six students. Second, third and fourth quarters. Dr. Jones, Dr. Stedman and Staff.

Research Preceptorship in Child Development. Introductory experience in research and methods of investigation pertaining to behavioral and biological factors in infants and children. May include parent-child relationships, learning, motivation, personality, perception,

cognition, psychophysiologic processes, and statistical techniques in common use. This course is also listed as Human Behavior 313. Limited to ten students. Four hours per day, two quarters. Time to be determined. Dr. Harris and Staff.

PHYSIOLOGY AND PHARMACOLOGY

Daniel C. Tosteson, M.D. (Harvard, 1949), *Professor of Physiology and Chairman of the Department.*

Eugene M. Renkin, Ph.D. (Harvard, 1951), B.S. (Tufts, 1948), *Professor of Pharmacology and Head of the Division of Pharmacology.*

Laboratories of the Division of Physiology

Auditory Physiology

Chief of Laboratory: Donald D. Greenwood, B.A. (Univ. of Wisconsin, 1951), Ph.D. (Harvard, 1960), *Assistant Professor of Physiology, Assistant Professor of Otolaryngology and Assistant Professor of Psychology.*

Cardiopulmonary Physiology

Chief of Laboratory: John V. Salzano, Ph.D. (Iowa, 1956), *Assistant Professor of Physiology.*

Frank G. Hall, Ph.D. (Wisconsin, 1923), *Professor of Physiology.*

E. Croft Long, M.B., B.S., Ph.D. (London, 1952 and 1957), *Associate Professor of Physiology, Associate in Pediatrics and Assistant Dean.*

Cellular Endocrinology

Chief of Laboratory: Jack L. Kostyo, Ph.D. (Cornell, 1957), *Associate Professor of Physiology.*

Cellular Neurophysiology

Chief of Laboratory: John V. Moore, Ph.D. (Virginia, 1945), *Associate Professor of Physiology.*

Toshio Narahashi, B.S. (Univ. of Tokyo, 1948), *Assistant Professor of Physiology.*

Nels Anderson, B.A. (Concordia, 1958), M.S. (Kansas State Univ., 1960), Ph.D. (Purdue, 1964), *Research Associate in Physiology.*

Cellular Transport Processes

Chief of Laboratory: Daniel C. Tosteson.

Thomas J. McManus, M.D. (Boston, 1955), *Assistant Professor of Physiology.*

Robert W. Blount, A.B. (Univ. of Los Angeles, 1951), Ph.D. (Univ. of Los Angeles, 1957), *Research Associate in Physiology.*

Chien Ping Lee, B.S. (Natl. Taiwan Univ., 1959), A.M. (Duke, 1961), Ph.D. (Duke, 1964), *Research Associate in Physiology.*

Mary Zinn, B.S. (Wake Forest Coll., 1959), M.A. (Duke, 1962), *Research Associate in Physiology.*

Thomas A. Andreoli, M.D. (Georgetown Univ., 1960), *Research Associate in Physiology and Associate in Medicine.*

Cerebral Physiology

Chief of Laboratory: Frans F. Jobsis, Ph.D. (Univ. of Michigan, 1958), B.S. (Univ. of Maryland, 1951), M.S. (Univ. of Michigan, 1953), *Assistant Professor of Physiology.*

Integrative Neurophysiology

Chief of Laboratory: George G. Somjen, M.D. (Univ. of New Zealand, 1961), *Assistant Professor of Physiology.*

Barbara Z. Renkin, B.A. (Bucknell Univ., 1952), M.A. (Mount Holyoke, 1954), Ph.D. (Johns Hopkins, 1959), *Associate in Physiology.*

Carl J. Gerber, Ph.D. (Washington Univ., 1960), *Associate in Physiology.*

Molecular Physiology

Chief of Laboratory: Jacob J. Blum, Ph.D. (Univ. of Chicago, 1952), *Associate Professor of Physiology.*

George M. Padilla, B.S. (George Washington Univ., 1952), M.S. (George Washington Univ., 1953), Ph.D. (Univ. of California, 1960), *Assistant Professor of Physiology.*

Varda Kahn, B.S. (Univ. of Illinois, 1956), M.S. (Univ. of Illinois, 1957), Ph.D. (Univ. of Illinois, 1959), *Research Associate in Physiology.*

Alfredo Bennun, B.S. (Natl. Univ. of Cordoba, 1954), M.S. (Natl. Univ. of Cordoba, 1957), Ph.D. (Natl. Univ. of Cordoba, 1963), *Research Associate in Physiology.*

Muscle Physiology

Chief of Laboratory: Paul Horowicz, Ph.D. (Johns Hopkins, 1955), *Associate Professor of Physiology.*

Robert Eisenberg, Ph.D. (Univ. Coll., London, 1965), *Associate in Physiology.*

F.B. Gibberd, M.B. (London Hospital Med. Coll.), *Research Associate in Physiology.*

Clinical Physiology

Saul Boyarsky, B.S. (Univ. of Vermont, 1943), M.D. (Univ. of Vermont, 1946), *Assistant Professor of Physiology and Professor of Urology.*

Jacqueline Hijmans, M.D. (State Univ. of Leyden, 1951), *Instructor in Physiology and Instructor in Medicine.*

Ralph J. Gorten, B.A. (Western Maryland Coll., 1951), M.D. (Univ. of Pennsylvania, 1955), *Associate in Physiology and Chief, Radioisotopes, V.A. Hospital.*

Robert Stempfel, Jr., M.D. (Vanderbilt, 1952), *Assistant Professor of Physiology and Associate Professor of Pediatrics.*

Howard K. Thompson, Jr., M.D. (Columbia Coll. of Physicians and Surgeons, 1953), *Associate in Physiology and Associate in Medicine.*

Macdonald Dick, M.D. (Johns Hopkins, 1928), *Assistant Professor of Physiology and Pharmacology and Associate in Medicine.*

Laboratories of the Division of Pharmacology

Biochemical Pharmacology

Chief of Laboratory: Frederick Bernheim, Ph.D. (Cambridge, 1928), *Professor of Pharmacology.*

William E. DeTurk, Ph.D. (Duke, 1940), M.D. (Vanderbilt, 1948), *Associate Professor of Pharmacology.*

Athos Ottolenghi, M.D. (Pavia, Italy, 1946), *Assistant Professor of Pharmacology.*

John D. Utley, Ph.D. (Duke, 1962), *Research Assistant in Pharmacology.*

Cardiac Pharmacology

Chief of Laboratory: Edward A. Johnson, M.B., Ch.B. (Univ. of Sheffield, 1950), M.D. (Univ. of Sheffield, 1953), *Associate Professor of Pharmacology.*

William A. Gay, B.A. (Virginia Military Inst., 1957), M.D. (Duke, 1961), *Research Associate in Pharmacology.*

Cellular Pharmacology

Chief of Laboratory: Paul Hochstein, B.S. (Rutgers, 1950), M.S. (Univ. of Maryland, 1952), Ph.D. (Univ. of Maryland, 1954), *Assistant Professor of Pharmacology.*

George S. Eadie, M.D. (Toronto, 1921), Ph.D. (Cambridge, 1927), *Professor Emeritus of Physiology and Pharmacology.*

Circulatory Pharmacology

Chief of Laboratory: Eugene M. Renkin.

Macromolecular Pharmacology

Chief of Laboratory: Leon Lack, Ph.D. (Columbia Univ., 1953), *Assistant Professor of Pharmacology.*

The required course in physiology consists of lectures, seminars and laboratory exercises offered by all members of the physiology staff during the fall term of the first year. The core course in pharmacology consists of lectures, seminars and laboratories offered by all members of the pharmacology staff during the spring term of the first year. These courses emphasize those facts and general principles of physiology and pharmacology which all medical students should learn no matter which of the many careers in medicine and the medical sciences they may choose to pursue.

Tutorial in Physiology and Pharmacology. Required for all third and fourth year medical students who elect to concentrate in physiology or pharmacology. Guided independent study of original literature leading to preparation of thesis. Laboratory work optionally assigned by tutor. Spring and fall terms. 4 quarters, 4 or more hours per week. All members of staff, every year.

Foundations of Contemporary Physiology. Seminar course in mathematics, physics and chemistry of special relevance to contemporary physiology. Physical and chemical principles are taught with examples from physiology. Spring term, 2 quarters, 4 hours per week. All members of the physiology staff, every year.

Clinical Physiology. A seminar course in human physiology emphasizing the physiological basis of clinical medicine. Physiological principles are illustrated by examples from clinical cases. Fall term, 2 quarters. Drs. Boyarsky, Gorten, Stempfel and staff, every year.

Physiological Instrumentation. Deals with modern electronic methods of measurement of physiological variables. The necessity of understanding the physiological system in order to avoid possible interaction between it and the measuring system is emphasized. The concepts and use of feedback to make linear instruments and to perform numerous operations are used throughout the course. Specific topics covered include: passive elements and networks, potentiometric and currentometric recorders and amplifiers, data processing, measurement

of biological potentials, currents, pressure and flow. Fall term, 2 quarters, 2 hours per week. Dr. Moore and members of the Dept. of Electrical Engineering, every year.

Cellular Endocrinology. Current concepts of the mechanism of action of hormones are covered with special reference to the effects of hormones on cell membrane permeability and on the activity of enzyme systems. The relationships of these cellular actions of hormones to the hormonal regulation of growth, metamorphosis, osmoregulation, pigmentation and reproduction are discussed. Spring term, 2 quarters, 2 hours per week. Dr. J. L. Kostyo, 1966 and every other year.

Topics in Muscle Physiology. This course will cover the following topics: Cellular basis of activity in skeletal, cardiac and smooth muscle; ionic properties of muscle membranes; submicroscopic structure of muscle and the molecular basis of contraction; the problem of electro-mechanical coupling; the mechanics and thermodynamics of muscular contraction; design and control problems for the production of movement in various animals. Fall term. 2 quarters, 2 hours per week. Dr. Horowicz, 1966 and every other year.

Cellular Transport Processes. A sequential study of the following topics: the physical chemistry of transport processes which occur in living cells (e.g., diffusion, flow, electric current), contemporary knowledge of the molecular mechanism of salt and water transport across cell membranes with special reference to the conversion of chemical bond energy to transport work in active transport, the integration of transport processes in individual plasma membranes to accomplish regulation of cytoplasmic salt and water composition and cell volume, and the secretion of fluids across epithelial cell layers in organs specialized for this function (intestine, kidney). Spring term. 2 quarters, 2 hours per week. Dr. Tosteson, 1967 and every other year.

Respiration and Aero-Physiology. A study of the fundamental respiratory processes in living organisms and of the special physiological responses and adjustments of individual during high-altitude flight. Lectures, conferences and laboratory. Spring term, 2 quarters, 2 hours per week, Drs. Hall and Salzano.

Physiology and Pharmacology of the Central Nervous System. A seminar course in the integrative functions of the central nervous system from simple reflexes involving the spinal cord to complex activities subserved by various regions of the brain. Spring term, 2 quarters, 2 hours per week. Dr. Somjen, B. Renkin and staff, 1967 and ever other year.

Physiology of Hearing. General principles of operation of sensory organs are illustrated by examples taken from the ear. Organization and integration of auditory input in the end organ, the brain stem

nuclei, and the central cortex are emphasized. Auditory perception is also discussed and related to neural mechanisms. Spring term, 2 quarters, 2 hours per week. Dr. Greenwood and staff, 1966 and every other year.

Cellular Metabolism and Energetics. The metabolic activity of cells will be considered from the point of view of the flow of energy through the cell. Special attention will be given to the mechanisms coupling the energy providing systems to the energy utilizing systems. Spring term, 2 quarters, 2 hours per week. Dr. Jobsis, 1966 and every other year.

Cellular Neurophysiology. Deals with current concepts as to the structure and electrical impulse propagation in nerves. The powerful new experimental techniques used in the study of isolated membranes and the resulting theoretical models are covered. Adaptation of these models assists in the description of receptor and synaptic properties. The effect of cellular geometry on its function is considered. Spring term, 2 quarters, 2 hours per week. Dr. Moore, 1967 and every other year.

Physiology of Cell Growth and Cell Development. Topics to be covered in this course will include: population kinetics; thermodynamics of growth; the timing of events of the cell cycle; molecular aspects of mitosis and of the duplication of cell organelles. Spring term, 2 quarters, 2 hours per week. Dr. Blum, 1967 and every other year.

Foundations of Contemporary Pharmacology. Chemical and physical principles underlying drug action are discussed. The role of various molecular properties in determining the biological effects of compounds is emphasized. Fall term, 2 quarters, 4 hours per week. Dr. E. Renkin and staff. Every year.

Circulatory Physiology and Pharmacology. A seminar course in the mode of distribution of drugs in the body. Special emphasis is given to the roles of blood flow and permeability factors in determining the rate and pattern of distribution. Fall term, 2 quarters, 2 hours per week. Dr. E. Renkin, 1967 and every other year.

Cardiac Physiology and Pharmacology. A study of cellular activity in the heart and how it is modified by drugs. Consideration is given to excitation, conduction, and contraction of cardiac muscle fibers in the presence and absence of pharmacologically active compounds. Fall term, 2 quarters, 2 hours per week. Dr. Johnson, 1966 and every other year.

Cellular Aspects of Drug Action. An introduction to cell-drug interaction emphasizing mechanisms of action and structure-activity relationships of chemical agents. Prerequisites: organic chemistry, introductory animal or plant physiology. Undergraduates by permission

of instructors. Fall term, 2 quarters, 2 hours per week. Drs. Bernheim, DeTurk and Ottolenghi, 1966 and every other year.

PHYSIOLOGY AND PHARMACOLOGY SEMINARS. A weekly meeting in which original researches by members of the staff and guests are reported. Required of all graduate students who are candidates for the M.A. or Ph.D. degree. All members of the Graduate Staff.

PREVENTIVE MEDICINE

D. T. Smith, M.D. (Johns Hopkins, 1922), *Professor and Chairman, Department of Preventive Medicine and James B. Duke Professor of Microbiology.*

William DeMaria, M.D. (Duke, 1948), *Professor of Preventive Medicine and Associate Professor of Pediatrics.*

E. C. Long, M.B., B.S., Ph.D. (London, 1952 and 1957), *Associate Professor of Preventive Medicine and Associate Professor of Physiology.*

Elbert Persons, M.D. (Harvard, 1927), *Associate Professor of Preventive Medicine and Professor of Medicine, in charge of the Duke University Student Health Program.*

Richard Portwood, M.D. (Southwestern, 1954), *Assistant Professor of Preventive Medicine and Assistant Professor of Medicine. Associate Director of Student Health.*

William M. O'Fallon, Ph.D. (Univ. of North Carolina, 1965), *Assistant Professor of Preventive Medicine, Biostatistics Unit.*

Dorothy Naumann, M.D. (Syracuse, 1940), *Associate in Preventive Medicine and Associate Director of Student Health in charge of Woman's Division.*

Conrad Knight, B.S. (Norwich University, 1953), *Associate in Preventive Medicine and Radiological Safety Officer.*

The required course in preventive medicine will be given during the first year. Forty lecture hours are given by faculty and guests. This series serves as an introduction to biostatistics, epidemiology, industrial medicine, community health and family physician, transmission and natural history of some diseases.

PROSPECTIVE MEDICINE—THE HUMAN RESPONSE TO ENVIRONMENTAL AGENTS. The range and variation of human response to overt and subtle environmental agents will be studied prospectively. The normal adaptative and immunologic mechanisms through which the human acts and reacts to maintain health will be discussed in chronologic sequence from conception through senility. Fundamental and applied information from medical, clinical, and social sciences will be included. Conditions or diseases with (1) known etiologic agents, such as viral, bacterial, fungal or parasitic, and (2) unknown etiology, such as hypertension and peptic ulcer, will be discussed. No limit to number of students. Three consecutive hours once each week. Second quarter. Dr. DeMaria and Staff.

INTERNATIONAL HEALTH ORGANIZATIONS. A seminar surveying the history, organization and accomplishments of the World Health Organization and its regional offices, health programs of the U. S. Agency for

International Development, the Alliance for Progress, the Rockefeller, Kellogg and other private foundations. Smaller private organizations (HOPE, MEDICO, etc.) and their contributions will be considered. Prerequisite for "International Medicine." Three lectures weekly for one quarter to be given once per year. 5-10 students. Second quarter. Dr. Long and Staff.

International Medicine. This course will include a survey of the inter-relationship of health with political, economic and educational programs, with emphasis on the problems of developing countries. Health problems of Latin America and Middle Africa will be given detailed consideration. The course will include a written paper by each participating student. Course on International Health Organizations is a prerequisite. Three lectures weekly for one quarter. Quarter to be determined. Dr. Long and Staff.

Research Preceptorship in International Health. The student will make a detailed study of a major health problem in the Western Hemisphere, using library and other resources. Spanish language instruction will be included through the Summer School program. The preceptorship will include a visit to a Latin American country for which financial assistance will be available. Courses on "International Medicine" are prerequisites. Summer quarter. Four days weekly. Dr. Long.

Research Preceptorship in Studies of Renal Function and the Vasculature. The student can enter into current projects or conduct independent study under senior staff guidance. The studies range from enzyme analysis of specific tissues under autonomic and pharmacologic influence to human conditioning experiments involving the cardio-renovascular systems. Full time for at least three consecutive quarters. One or two students by special arrangement. Dr. DeMaria.

Adolescent Medicine. These series will review primarily the sequence of biologic events occurring during this transitional phase of human development. Relationship of these factors to the diseases and psycho-social problems encountered will also be discussed. One hour per week during third and fourth quarters. No limit on number of students. Drs. DeMaria, Persons, Portwood, Naumann and guests.

Student Health. One half time (afternoon) for one or two quarters by special arrangement. Dr. Persons and Staff.

Note: The department will offer an elective three-phase program utilizing summer and/or elective periods. This is a formal and applied program in community health at a national and international level and is under the combined direction of the University of North Carolina School of Public Health, University of North Carolina Department of Preventive Medicine and the Duke Preventive Medicine Department. Dr. DeMaria and Dr. Long by special arrangement.

PSYCHIATRY

Ewald W. Busse, M.D. (Washington Univ., 1942), *Professor of Psychiatry and Chairman of the Department.*

Irving E. Alexander, Ph.D. (Princeton, 1949), *Professor of Medical Psychology; Professor of Psychology.*

Kurt W. Back, Ph.D. (Massachusetts Inst. of Tech., 1949), *Professor of Medical Sociology; Professor of Sociology.*

Bernard Bressler, M.D. (Washington Univ., 1942), *Professor of Psychiatry.*

Sanford I. Cohen, M.D. (Chicago Med. Coll., 1952), *Professor of Psychiatry.*

Bingham Dai, Ph.D. (Chicago, 1935), *Professor of Mental Hygiene; Professor of Psychology.*

John A. Fowler, M.D. (Bowman Gray, 1946), *Professor of Psychiatry and Assistant Professor of Pediatrics.*

Leslie B. Hohman, M.D. (Johns Hopkins, 1917), *Professor Emeritus of Psychiatry and Consultant in Psychiatry; Assistant Professor of Pediatrics.**

Hans Lowenbach, M.D. (Hamburg, 1929), *Professor of Psychiatry and Assistant Professor of Pediatrics.*

George L. Maddox, Jr., Ph.D. (Michigan State Univ., 1956), *Professor of Medical Sociology; Professor of Sociology.*

John C. McKinney, Ph.D. (Michigan State, 1953), *Professor of Medical Sociology; Professor of Sociology and Chairman, Department of Sociology.*

Walter D. Obrist, Ph.D. (Northwestern, 1950), *Professor of Medical Psychology; Lecturer in Psychology.*

John M. Rhoads, M.D. (Temple, 1943), *Professor of Psychiatry.*

William P. Wilson, M.D. (Duke, 1947), *Professor of Psychiatry.*

John C. Altrocchi, Ph.D. (California, 1957), *Associate Professor of Medical Psychology; Assistant Professor of Psychology.*

Lloyd J. Borstelmann, Ph.D. (California, 1950), *Associate Professor of Medical Psychology; Associate Professor of Psychology.*

Jack Botwinick, Ph.D. (New York Univ., 1953), *Associate Professor of Medical Psychology.*

Robert C. Carson, Ph.D. (Northwestern, 1957), *Associate Professor of Medical Psychology; Assistant Professor of Psychology.*

Carl Eisdorfer, Ph.D. (New York, 1959); M.D. (Duke, 1964), *Associate Professor of Medical Psychology; Lecturer in Psychology.*

Ila H. Gehman, Ed.D (Pennsylvania State, 1947), *Associate Professor of Medical Psychology; Lecturer in Psychology.*

Robert L. Green, Jr., M.D. (Hahnemann, 1946), *Associate Professor of Psychiatry.*

Harold J. Harris, M.D. (Long Island Coll. of Med., 1949), *Associate Professor of Psychiatry and Assistant Professor of Pediatrics.*

Frederick R. Hine, M.D. (Yale, 1949), *Associate Professor of Psychiatry.*

Martin Lakin, Ph.D. (Chicago, 1955), *Associate Professor of Medical Psychology; Associate Professor of Psychology.*

Charles E. Llewellyn, Jr., M.D. (Med. Coll. of Va., 1946), *Associate Professor of Psychiatry.*

Jack J. Preiss, Ph.D. (Michigan State, 1954), *Associate Professor of Medical Sociology; Associate Professor of Sociology.*

Barry M. Shmavonian, Ph.D. (Univ. of Washington, 1957), *Associate Professor of Medical Psychology; Lecturer in Psychology.*

George A. Silver, M.D. (Duke, 1938), *Associate Professor of Psychiatry.*

* Retired August 30, 1960.

Herbert F. Crovitz, Ph.D. (Duke, 1960), *Assistant Professor of Medical Psychology; Lecturer in Psychology.*

Ben W. Feather, M.D. (George Washington, 1956), *Assistant Professor of Psychiatry.*

Peter L. Hein, Jr., M.D. (George Washington, 1955), *Assistant Professor of Psychiatry.*

Mary M. Huse, Ph.D. (Duke, 1959), *Assistant Professor of Medical Psychology; Lecturer in Psychology.*

J. David Jones, M.D. (Duke, 1954), *Assistant Professor of Psychiatry and Associate in Pediatrics.*

Charles R. Keith, M.D. (Kansas Univ., 1957), *Assistant Professor of Psychiatry.*

Irwin Kremen, Ph.D. (Harvard, 1961), *Assistant Professor of Medical Psychology; Assistant Professor of Psychology.*

Arnold D. Krugman, Ph.D. (Univ. of Kentucky, 1952), *Assistant Professor of Medical Psychology.*

Maurine B. LaBarre, M.S.W. (Bryn Mawr, 1934), *Assistant Professor of Psychiatric Social Work.*

Stanley S. Needell, M.D. (Virginia, 1956), Assistant Professor of Psychiatry.

Claude R. Nichols, Jr., M.D. (Baylor, 1946), *Assistant Professor of Psychiatry.*

John B. Reckless, M.B., Ch.B. (Univ. of Birmingham, England, 1954), *Assistant Professor of Psychiatry.*

Robert E. Smith, M.D. (N. Y. Med. Coll., 1954), *Assistant Professor of Psychiatry; Assistant Professor of Pastoral Care and Psychiatric Counseling.*

Wilford W. Spradlin, M.D. (Virginia, 1957), *Assistant Professor of Psychiatry.*

Donald J. Stedman, Ph.D. (George Peabody Coll., 1962), *Assistant Professor of Medical Psychology.*

Larry W. Thompson, Ph.D. (Florida State, 1961), *Assistant Professor of Medical Psychology; Lecturer in Psychology.*

Russell F. Tomlinson, Ph.D. (Florida, 1957), *Assistant Professor of Medical Psychology.*

Adriaan Verwoerdt, M.D. (Amsterdam, 1952), *Assistant Professor of Psychiatry.*

Martha L. Wertz, M.S.W. (Tulane Univ. School of Social Work, 1952), *Assistant Professor of Psychiatric Social Work.*

Weston LaBarre, Ph.D. (Yale, 1937), *Consultant; Professor of Anthropology.*

Elaine K. Crovitz, Ph.D. (Duke, 1964), *Associate in Medical Psychology.*

Alfred Dean, M.A. (Univ. of North Carolina, 1958), *Associate in Medical Sociology.*

Carey B. Duncan, Ph.D. (George Peabody Coll., 1964), *Associate in Medical Psychology.*

Frances C. Jeffers, M.A. (Columbia, 1945), *Research Associate in Psychiatry.*

Demmie C. Mayfield, M.D. (Univ. of Texas Med. Br., 1958), *Associate in Psychiatry.*

Muriel J. McLauchlin, M.S.W. (Pennsylvania School of Social Work, 1937), *Research Associate in Psychiatric Social Work.*

Charles W. Neville, Jr., M.D. (Vanderbilt, 1956), *Associate in Psychiatry.*

Marcelino Amaya, M.D. (Univ. Nacional Autonoma de Mexico, 1954), *Adjunct Instructor in Psychiatry.*

William B. Anderson, M.D. (Univ. of Minnesota, 1948), *Instructor in Psychiatry and Fellow in Child Psychiatry.*

John R. Ball, M.S.W. (Univ. of North Carolina, 1962), *Instructor in Psychiatric Social Work.*

Norbert B. Enzer, M.D. (McGill, 1956), *Instructor in Psychiatry and Fellow in Child Psychiatry and Instructor in Pediatrics.*

Charles W. Erwin, M.D. (Texas, 1960), *Instructor in Psychiatry and Fellow in Psychiatric Research.*

Pedro J. Irigaray, M.D. (Mexico, 1955), *Adjunct Instructor in Psychiatry.*

Roby M. Kerr, M.S.W. (Tulane Univ. School of Social Work, 1962), *Instructor in Psychiatric Social Work.*

Larry R. Kroner, M.D. (George Washington, 1955), *Adjunct Instructor in Psychiatry.*

Miriam L. Leventhal, M.S.W. (Hunter Coll. of City Univ. of New York School of Social Work, 1963), *Instructor in Psychiatric Social Work.*

Herman P. Lineberger, M.D. (Univ. of North Carolina, 1954), *Instructor in Psychiatry.*

Anna M. MacLauchlin, M.S.S. (Smith Coll. School of Social Work, 1959), *Instructor in Psychiatric Social Work.*

Barbara A. Pope, M.S.S.W. (Richmond Prof. Inst. of Social Work, 1953), *Instructor in Psychiatric Social Work.*

Hsioh-shan Wang, M.D. (National Taiwan Univ. Med. Coll., 1953), *Instructor in Psychiatry and Fellow in Psychiatric Research.*

Dorothy K. Heyman, M.S.W. (Pennsylvania School of Social Work, 1940), *Assistant in Psychiatric Social Work.*

Staff, Highland Hospital, Asheville, N. C.

Marie Baldwin, M.D. (South Carolina, 1929), *Associate in Psychiatry.*

Teodoro Braganza, M.D. (Univ. of Philippines, 1952), *Instructor in Psychiatry.*

Anne E. Sagberg, M.D. (Oslo, 1947), *Associate in Psychiatry.*

John T. Wood, M.D. (Virginia, 1955), *Instructor in Psychiatry.*

Donald R. Boone, M.S.W. (North Carolina, 1959), *Psychiatric Social Worker.*

Elizabeth B. Harkins, M.A. (Pittsburgh, 1938), *Psychiatric Social Worker.*

Fellows in Psychiatry

Andrew J. Courts, M.D. (Univ. of North Carolina, 1958).

John B. Nowlin, M.D. (Duke, 1957).

Prescott A. Walker, M.D. (Med. Coll. of South Carolina, 1959).

Residents in Psychiatry

David A. Frieske, M.D. (Washington Univ., 1961), *Chief Resident.*

James L. Elmore, M.D. (Univ. of Tennessee, 1961).

Donald R. Fowler, M.D. (Southwestern, 1961).

Daniel T. Gianturco, M.D. (Buffalo, 1960), *Assistant in Psychiatry.*

Ralph M. Klopper, M.D. (Univ. of Missouri, 1961).

Virginia L. Moreland, M.D. (Univ. of Illinois, 1960).

Albert H. Powell, Jr., M.D. (Duke, 1957).

Edward L. Reilly, M.D. (Seton Hall Coll. of Med., 1961).

William M. Taylor, M.D. (Med. Coll. of Virginia, 1959).

William K. Zung, M.D. (Univ. of Texas, 1961).

Assistant Residents in Psychiatry

Gilbert H. Berken, M.D. (Univ. of Miami, 1963).

Richard B. Boren, III, M.D. (Duke, 1953).

Lawrence Bryskin, M.D. (Univ. of Illinois, 1963).

Sherrill A. Conna, M.D. (Duke, 1962).
Robert A. Doyle, M.D. (Duke, 1963).
Paul F. Glass, Jr., M.D. (Baylor, 1946).
Cesar Guajardo, M.D. (Univ. of Nuevo Leon, Mexico, 1961).
Nancy R. Haslett, M.D. (Duke, 1963).
Richard A. Liguori, M.D. (Duke, 1963).
James D. Mallory, Jr., M.D. (Duke, 1958).
Robert M. Martin, Jr. (Emory, 1952).
Jesse N. McNiel, M.D. (Univ. of Arkansas, 1960).
Benjamin R. Ogburn, M.D. (Med. Coll. of Virginia, 1956).
James C. Repass, M.D. (Med. Coll. of Virginia, 1961).
Marvin J. Short, II, M.D. (Duke, 1962).
Gilbert Silverman, M.D. (Univ. of Bern, Switzerland, 1960).
Michael R. Sottarelli, M.D. (Seton Hall Coll. of Med., 1963).
Otho Lee Trick, M.D. (Indiana Univ., 1958).

Psychology Interns in the Department of Psychiatry

Elizabeth Bankson, B.A. (Valparaiso Univ., 1962).
Hans O. Doerr, M.S. (Florida State, 1962).
Robert W. Holmstrom, B.A. (Trinity Coll., 1961).
Glenn A. Miller, M.A. (Kentucky, 1962).

Human Behavior and Psychiatry

In addition to required and elective courses in clinical psychiatry this department offers, through its Division of Human Behavior, course work in the biological and behavioral sciences which form the bases of psychiatry and the psychological aspects of medicine.

During the first year, 60 hours are devoted to human behavior. A lecture series introduces the student to the concepts, techniques, and data of the various sciences most relevant to an understanding of human behavior, thus providing a multifaceted approach to that understanding. Lectures from the fields of behavioral neurobiology, psychology, psychiatry, internal medicine and sociology discuss behavior from the points of view of heredity and constitution; the central and autonomic nervous systems; inner emotional conflicts and interpersonal relationships; learning, cognition and perception; relationships between the individual and his family, the social institutions, and his sub-culture and culture. Both functional and developmental points of view are presented and, in connection with the latter, stages in the development of the individual personality are traced. Wherever possible, relationships between the various approaches to human behavior are stressed. Concurrent with the lectures, a series of small group meetings provide, through the interviewing of patients and group discussion, opportunity for the further assimilation of the lecture material and its application to specific examples of behavior. The small groups also provide op-

portunities to introduce effective techniques of human interaction and observation of the primary data of human behavior as well as methods of recording and interpreting these observations. In both the didactic and small group "laboratory" portions of the course, emphasis is placed upon the complementarity of the biological and psychosocial approaches to human behavior and the relevance of such a combined approach for the practice of medicine.

The required second-year course in clinical psychiatry is for seven weeks. The student assumes limited responsibility, under supervision, for diagnosis and treatment of patients on the psychiatric wards, in the psychiatric out-patient clinic, and (through the psychosomatic consultation services) on the non-psychiatric wards of the hospitals. Supervision is directed toward two principle areas. The first is the significant application of concepts of diagnosis, psychopathological formulation, and therapy. Concepts in these areas are drawn from both the descriptive-organic-directive and the psychoanalytic-psychosocial-psychotherapeutic contributions to current psychiatric thought. Secondly, supervision is aimed at further developing interpersonal techniques of sensitive observation and therapeutic use of the self. Emphasis is placed upon concepts and techniques applicable to all patients as well as those specifically designated "psychiatric." Didactic instruction includes seminars on the principle neurotic conditions (symptomatic, characterological and psychophysiological), the major psychoses, emotional problems of childhood, the somatic therapies, psychological testing, and introductory electroencephalography. In addition to rounds and case conferences students are encouraged to observe psychotherapy and participate in supervised psychotherapeutic encounters whenever appropriate situations can be provided.

Human Behavior

Philosophy of Science and the Behavioral Sciences. A survey of current theories of knowledge, particularly as they relate to the special complex problems of empirical meaning, objectivity, measurement, and verification in studies of human behavior. Consideration is also given to the mind-body problem. Twice weekly for 1½ hours for one quarter. To be offered twice during the year, first and fourth quarters. Dr. Hine.

Introduction to Behavioral Research. An intensive introduction to the logic and principles of experimental design and data processing in psychological research. Emphasis will be upon techniques of experimentation with molar behavioral variables and upon critical analysis of published research in psychiatrically relevant areas. Philosophy of Science and the Behavioral Sciences is a prerequisite. One

hour, three times weekly for one quarter. To be offered twice a year, second and fourth quarters. Dr. Carson and Staff.

Introduction to Statistical Analysis and Inference. An introduction to probability theory and the use of descriptive and inferential statistics in scientific research. Topics will include measurement distributions, sampling, scaling, the concept of variance, correlation, and analysis of experimental data. The student will be introduced to the use of parametric and non-parametric techniques suitable for use with behavioral and biometric variables. One hour, three times weekly for one quarter. To be given twice a year, third and summer quarters. Dr. Carson and Staff.

The Biological Evolvement and Neural Basis of Behavior. A seminar surveying the biological bases of human behavior through discussions of imprinting; early mammalian affective development; classical and instrumental conditioning with particular emphasis on the autonomic nervous system; the psychological literature on RNA research; electrophysiologic correlates of higher mental processes including learning, memory and perception; the relevant human and animal literature on EEG; evoked potentials and microelectrode recording. Theoretical formulations based on communication theory will be presented. Three times weekly for 1½ hours for two quarters. To be given once per year, time of year to be determined. Drs. Shmavonian, Obrist, Spradlen and Staff.

Human Behavior and Cerebral Dysfunction. This course will include a brief historical review of significant figures and trends of thought in the area of brain function covering the associationistic schools of thought, subsequent development of the reactionary field theories, and recent trends toward the revival of localization of function. Pathological conditions of the brain will be reviewed with emphasis upon how such conditions might differentially affect the structure and function of the nervous system. A presentation of the behavioral correlates of brain damage will be included. Focus will be on an examination of evidence for and against the regional localization of psychological abilities. The course includes five hours of assessment activity with brain-damaged patients. One hour, twice weekly for one quarter. Time of year to be determined. Dr. Thompson.

Group Dynamics and Group Sensitivity Training. A series of seminars dealing with the data and theory of small group processes, plus a two-week sensitivity training experience whereby individuals learn about effects of interpersonal interactions and group processes through direct experience. Behaviors and feelings are discussed as these contribute to the development of a specific group culture. In encouraging self-awareness, the technique becomes an educational device which

offers potential for generalizing to other interpersonal situations. Permission of the instructor is required for participation in this course. One hour, once weekly for one quarter plus daily 1½ hour meetings during a two week segment of the quarter. Time of year and number of times offered to be determined. Dr. Lakin.

Personality Development of the Child, Adolescent, and Adult. A survey of personality development from pregnancy through old age, combining biological and psychodynamic approaches. Included are didactic presentations, discussions of assigned literature, and direct observations of, and interaction with, normal children and adults of various ages and in several settings. Two hours, three times weekly for one quarter. To be offered three times per year, quarters to be determined. Dr. H. J. Harris and Staff.

Comparative Personality Theory. An examination of representative models of human functioning from Freud to the present. Topics will include examples from psychoanalytic, interpersonal, field theoretical, and behavioristic approaches. One hour, three times weekly for one quarter. Quarters to be determined. Dr. E. Crovitz.

Principles of Psychological Assessment. A theoretical and technical introduction to the measurement of individual differences by means of psychometric and projective approaches. The student is introduced to the theory of test development and application through an examination of such concepts as standardization, reliability, and validity. Exemplary assessment instruments are subjected to detailed analysis. One hour, three times weekly for one quarter. To be given twice yearly, first and third quarters. Dr. Huse.

Social and Cultural Aspects of Illness. A seminar on medically relevant social roles in an institutional context, the doctor-patient relationship, and the hospital as a social organization. Two hours, once weekly for two quarters. To be given once each year, time of year to be determined. Dr. Maddox or Dr. Preiss.

Experimental and Clinical Psychopathology and Psychophysiology Seminar. The aim of this seminar is to examine clinically defined categories of psychopathology and experimentally produced analogues of clinical symptoms. Neurophysiologic, biochemical, sociocultural, psychodynamic, conditioned reflex, and developmental clinical and laboratory studies related to psychopathological symptom formation are reviewed and related to case material whenever possible. The emphasis is on developing testable explanatory concepts of clinical psychosomatic and psychopathologic symptoms, and on the integration of experimental research and clinical observations. Two hours, once weekly for two quarters. Course given once each year, first quarter. Dr. Cohen.

Research Preceptorship in Biological Psychiatry. This course will be comprised of selected experiments and instruction in experimental and clinical neurophysiology, physiology, and neurochemistry. The course content can be altered to include other subjects such as neuroendocrinology or neuropharmacology. Full time for two or three quarters; up to one half time may be used for didactic work in related courses. To be offered throughout the year. Dr. Wilson.

Research Preceptorship in Child Development. Introductory experience in research and methods of investigation pertaining to behavioral and biological factors in infants and children. May include parent-child relationships, learning, motivation, personality, perception, cognition, psychophysiologic processes, and statistical techniques in common use. (This course is also listed by the Department of Pediatrics.) Half time daily for one quarter. Offered throughout the year. Dr. H. J. Harris.

Research Preceptorship in Social Psychology. Experience in the design and execution of medically relevant research involving small human groups in an experimental setting. Four hours per week for one quarter. To be offered alternate quarters throughout the year. Dr. Back.

Research Preceptorship in Psychopharmacology. The student participates in a study of psychotropic drug action on patients and normal subjects, utilizing physiological and psychological measures. Five hours daily, four days weekly for one quarter. To be given throughout the year except summer quarter. Dr. Reckless.

Research Preceptorship in Psychophysiology. Students either will conduct an independent supervised investigation, or will work on investigations already underway, and will complete a critical review of experimental and clinical literature relevant to the research in which they participate. The students will attend weekly conferences of the Division of Psychophysiologic Research in which current research of trainees is reviewed; Psychophysiology Student Training Seminars devoted to research design and statistical analysis of psychophysiologic data, biolectric measurement techniques, experimental methods in psychophysiology; and the seminar of the Mental Health Research Training Program in Biologic Science. The senior seminar will be presented by the training staff of the Mental Health Basic Biologic Research training program to acquaint trainees and students with current research of the various disciplines in the program such as neuroanatomy, neurophysiology, muscle physiology, biochemistry, endocrinology, psychophysiology, and bioradiophysics. The seminar will include critical reviews of areas such as nucleic acid and memory mechanisms, physiology of emotional states, neural basis of conditioning, behavior and emotions,

neurophysiology of motivation, neurochemistry of c. n. s. energy transfer, neuropharmacology, chromosomal aberrations, and phychosexual development. The major aim of the training period is not to develop technically skilled researchers but rather to broaden the students' understanding of human behavior and psychophysiology and the experimental approaches to these areas which may have application to clinical diagnosis and treatment. Human Behavior and Psychiatry are prerequisites or must be taken concurrently with this preceptorship. Full time for a mimimum of three quarters. Offered throughout the year by special arrangement with instructor. Drs. Cohen, Shmavonian and P. Hein.

Processes of Aging. Basic information on theoretical and experimental work in the field of Aging will be presented by the investigators in many disciplines. Biochemistry, medicine, surgery, psychiatry, neurosurgery, and neurophysiology will comprise the biological section. Psychology, psychophysiology, sociology, and economics will comprise the behavioral section. The emphasis will be upon a broad base of current knowledge about the aging process. Students from any medical discipline are welcome. This course will be interdisciplinary in nature throughout. Two hours, twice weekly for one quarter. To be offered once per year, time of year to be determined. Dr. Busse and Staff.

Psychiatry

History of Psychiatry. A seminar tracing the origins and development of current psychiatric concepts and the influence and contribution of both psychodynamic and biologic orientations. One hour, once weekly for one quarter. To be offered twice yearly, second and fourth quarters. Dr. Spradlin.

Language, Communication and Interviewing. An advanced seminar in interviewing, including verbal and non-verbal communication, formation and resolution of patient resistance, and techniques in the control of the interview situation. Patient interviews and tape recordings will be employed. Two hours, once weekly for one quarter. To be offered twice yearly, first and third quarters. Drs. Hein, Spradlin and Green.

Psychiatry in a Community Context. A seminar on the epidemiology of mental health and illness and on organizational aspects of mental health facilities and services in the community. Two hours, once weekly for two quarters, second and third quarters. Dr. Maddox or Dr. Preiss.

In-Patient Psychiatry: Environmental and Somatic Therapy. An advanced clinical course in in-patient psychiatry covering diagnosis, formulation, and therapeutic management including management of the ward milieu and utilization of nurses and ward personnel in therapy.

The student's responsibilities for patient care and therapy are increased in accord with his abilities. Therapeutic Environments and Patient Care is a prerequisite or must be taken concurrently. Full time for one quarter. Offered throughout the year. Drs. Green, Hine and Staff.

Principles and Practice of Out-Patient Psychiatry. This is the advanced clinical course in out-patient psychotherapy. Students will interview patients in the psychiatric out-patient clinic and present the findings of the intake interview at a daily conference where diagnosis and disposition are planned. Students will also be assigned to patients for psychotherapy under supervision by senior and resident staff. Attention will be devoted to the operation of a psychiatric out-patient clinic, its psychiatric teams, and the interaction of the clinic with community agencies and resources. In special cases arrangements may be made for continued supervised therapy beyond the single quarter. Half time (9:00 a.m.-2:00 p.m.). Four days per week for one quarter. Offered throughout the year. Dr. Llewellyn and Staff.

Psychosomatic Medicine. This is the advanced clinical course in psychosomatic medicine which stresses the principles of the psychosomatic approach based on an integration of psychophysiology and psychodynamics illustrated through ward rounds and case conferences. The student assumes responsibility for selected, individually supervised patient care. Students may choose to concentrate on one specific area, e.g., pediatrics, obstetrics and gynecology, internal medicine, surgery, etc. If the two-quarters course is elected a clinical research project in psychosomatic medicine may be included. Ten hours per week to be arranged with faculty, one or two quarters. Offered throughout the year except summer quarter. Dr. Cohen and Staff.

Psychosomatic Seminar. A seminar reviewing current concepts of body-mind relationships as they pertain to health and disease. Clinical material and a selective literature review are included. One and one-half hours, once per week for one quarter. Offered twice yearly, second and fourth quarters. Dr. Green and Staff.

Special Topics in the Psychological Aspects of Medicine. A combined clinical and reading seminar intended to clarify the importance of various psychologically-conceived variables in the practice of medicine. Included are psychological test dimensions such as intelligence and abstracting ability, and dimensions of individual difference such as perceptual and cognitive variables. Rounds are conducted to increase the student's awareness of behavioral dimensions in the physically ill patient and their relevance to patient care. Research preceptorships in this area are available following the completion of the structured course. One hour, three times weekly for one quarter. Time of year to be determined. Dr. Eisdorfer.

Community Psychiatry and Mental Health. Students will participate in a seminar covering principles of the mental health consultation process with specific reference to the physicians serving it as consultants to individuals, groups or agencies. The student will observe this process in action with a staff psychiatrist. Discussion will include the principles of preventive psychiatry, the structure of community organization, and the role of the psychiatrist and physician in helping the community find ways of meeting its mental health needs. Community resource people will be brought into these seminars when appropriate and field trips to community agencies will be arranged. Psychiatry in a Community Context is a prerequisite. Two hours, twice weekly for one quarter. To be offered twice yearly, first and third quarters. Dr. Llewellyn and Staff.

Principles and Practice of Group Psychotherapy. The student will be given an introduction to the principles and application of group psychotherapy. He will observe groups in action and will participate in discussions of observed group processes. Two hours, twice weekly for one quarter. To be offered three times per year, quarters to be determined. Dr. Llewellyn and Staff.

Marriage Counseling in Medical Practice. A seminar dealing with the concepts of marital pathology, sexual behavior in marriage, neurotic interaction in marriage, and the reaction of marriage to stress. Techniques and methods of premarital and marital counseling will be discussed. "Language, Communication and Interviewing" is a prerequisite. One hour, once weekly for two quarters. Time of year to be determined. Dr. Llewellyn and Staff.

Schizophrenia: Research and Clinical Aspects. This literature seminar will review theories of the etiology of schizophrenia, including theories at the biological, individual psychodynamic, communication, and family dynamic levels, and concepts of management and treatment of the schizophrenic patient and the patient suffering from related conditions. One hour per week for two quarters. Time of year to be determined. Drs. Tomlinson and Hine.

Clinical Electroencephalography. Instruction in technique and clinical aspects of electroencephalography. Included are didactic as well as practical instruction in EEG theory and interpretation. Research in clinical EEG may be included. It is recommended that this course be taken concurrently with courses in related areas. Eight hours, two days per week for two quarters. Time of year to be arranged. Drs. Wilson, Green and Staff.

Practice of Psychological Assessment Techniques. Demonstrations and opportunity for practice in the administration and interpretation of psychological assessment techniques with emphasis on the

potential utility of these techniques to physicians. One hour, three times per week for one quarter. Time of year may be arranged. Drs. Huse, Krugman and Staff.

Mental Retardation: Birth to End of School Age. A survey of medical, psychological, social, and special education aspects of mental retardation, including clinic evaluation and management approaches. Use is made of existing pediatric, neurologic, endocrinologic and Child Guidance Clinic facilities, and field work at the Murdoch School. (This course is also listed by the Department of Pediatrics.) Two hours, three days per week for one quarter. Time of year to be arranged. Dr. Stedman and Staff.

Mental Retardation: Young Adulthood to Old Age. A survey of the biological, psychological, vocational rehabilitation, and employment aspects of the adult mental retardate. Included are management and planning with families, and sociological problems. Two hours, three times per week for one quarter. Time of year to be arranged. Dr. Stedman.

Emotional Problems of Childhood and Adolescence. This advanced clinical course in child psychiatry surveys major psychological problems of children and adolescents. The course consists of lectures, conferences, assigned reading, and supervised clinical experience in the Child Guidance Clinic. Half time. Five days per week for two quarters. Offered throughout the year. Dr. H. J. Harris and Staff.

Institutional Resources for Children. A survey of institutional resources in our society for the education and care of children who have special needs. The course includes lectures, reading, discussion, field visits, and observation or supervised service to children in the Wright School, Umstead Hospital Adolescent Unit, Murdoch Diagnostic Clinic, and Child Psychiatry Unit. Two hours, three days per week for two quarters. Time of year to be arranged. Dr. H. J. Harris and Staff.

Alcoholism. A combination of didactic material and contact with a variety of professional personnel and facilities involved in the therapeutic management of persons presenting an alcohol-related problem. Two hours, once weekly for one quarter. To be offered twice yearly, time to be arranged. Dr. Maddox and Staff.

Social Structure and the Life Cycle: The Adolescent. A combination of didactic material and clinical experience integrating medically relevant social, psychological, and physiological aspects of an important developmental stage. Two hours, twice weekly for one quarter. To be given twice yearly, time to be determined. Drs. Keith and Maddox.

Social Structure and the Life Cycle: the Aged Person. A combination of didactic material and clinical experience integrating

medically relevant social, psychological, and physiological aspects of another important developmental phase. Included are discussions of the cerebral physiology of senescence and the relation of impaired cerebral physiology to mental function in old age. Two hours, twice weekly for one quarter. Time of year to be arranged. Drs. Busse, Maddox, Obrist and Staff.

Geriatric Psychiatry. The course will include lectures, supervised literature review, and clinical work in a variety of settings; in-patient and out-patient psychiatry; private and public hospital; and interview with subjects in retirement homes and in a project concerned with psychiatric factors in the lives of community residents. The focus will be upon geriatric psychiatric diagnosis and management. This course is intended for senior students interested in psychiatry as a career. It is advisable but not required that the individual will have taken the course "Processes of Aging" in the junior year. Research preceptorships in this area are available. Four hours, twice weekly for one quarter. Offered throughout the year. Dr. Busse and Staff.

Preceptorships in Clinical Psychiatry. By personal arrangement with members of the clinical staff it is possible for students to participate in varying degrees in the professional life of clinical psychiatrists. Various members of the Clinical Staff.

Preceptorships in Clinical Psychiatric Research. Preceptorships may be oriented more toward the participation in or conduct under supervision of clinical research projects. Various members of the Clinical Staff.

RADIOLOGY

Richard G. Lester, M.D. (Columbia, 1948), *Professor of Radiology and Chairman of the Department.*

Robert J. Reeves, M.D. (Baylor, 1924), *Professor of Radiology.*

George J. Baylin, M.D. (Duke, 1937), *Professor of Radiology.*

William Francis Barry, Jr., M.D. (Pennsylvania, 1946), *Associate Professor of Radiology and Assistant Professor of Medicine.*

Patrick J. Cavanaugh, M.D. (St. Louis, 1951), *Associate Professor of Radiology in Charge of Division of Radiation Therapy.*

John Ashley Goree, M.D. (Duke, 1955), *Associate Professor of Radiology and Associate in Anatomy.*

Boyd Thomas Worde, M.D. (Tennessee, 1947), *Associate Professor of Radiology.*

M. Paul Capp, M.D. (Univ. of North Carolina, 1958), *Assistant Professor of Radiology.*

Seuk Ky Kim, M.D. (Severance Med. Coll., Seoul, Korea, 1950), *Assistant Professor of Radiology.*

Aaron P. Sanders, M.S. (Rochester, 1952), Ph.D. (Univ. of North Carolina, 1964), *Assistant Professor of Radiology, Scientific Director of Isotope Laboratory, Physicist.*

Felix J. Pircher, M.D. (Univ. of Innsbruck, Austria, 1939), *Assistant Professor of Radiology, Chief of Isotope Division.*

Raben, Milton, M.D. (Tufts Univ. Sch. of Med., 1959), *Associate in Radiation Therapy.*

Alice L. McCrea, M.S. (Univ. of Chicago, 1958), *Assistant Professor of Radiology and Radiation Physicist.*

John B. Cahoon, R.T. (Duke, 1939), F.A.S.X.T., *Assistant Professor of Radiologic Technology.*

Visiting Staff

William Sprunt, M.D. (Harvard, 1945), *Assistant Professor of Radiology, Chief Department of Radiology, Wake County Memorial Hospital.*

Owen W. Doyle, M.D. (Yale, 1947), *Associate Professor of Radiology.*

John F. Sherrill, Jr., M.D. (Bowman Gray, 1945), *Assistant Professor of Radiology, Chief, Radiology Watts Hospital.*

Guy W. Schlaseman, M.D. (Duke, 1946), *Assistant Professor of Radiology.*

Donald Monson, M.D. (Univ. of Wisconsin Med. Sch., 1955), *Associate in Radiology.*

Thomas G. Thurston, M.D. (Harvard, 1941), *Associate in Radiology.*

John Edmond Wear, M.D. (Alabama, 1945), *Associate in Radiology.*

Simmons Isler Patrick, M.D. (Duke, 1951), *Associate in Radiology.*

Cyrus L. Gray, M.D. (Duke, 1937), *Associate in Radiology.*

Residents

William B. Davis, Jr., M.D. (Univ. of Pennsylvania, 1957).

James W. Gibson, Jr., M.D. (Univ. of Tennessee, 1957).

Addison G. Mangum, M.D. (Univ of North Carolina, 1958).

Charles W. George, M.D. (Univ. of Tennessee, 1958).

Clarence S. Davis, Jr., M.D. (Med. Coll. of South Carolina, 1961).

Philip Howerton, M.D. (Duke, 1958).

Honoratio H. Piedad, M.D. (Far Eastern Univ., Manila, Philippines, 1959).

Robert G. Bradbury, M.D. (Med. Coll. of South Carolina, 1958).

Raymond L. Thomas, M.D. (Duke, 1962).

Matthew H. Grimmett, M.D. (Duke, 1943).

Hewlette C. Connell, M.D. (Med. Coll. of Georgia, 1957).

Juan Carranza, M.D. (San Carlos Univ., Guatemala, 1960).

Samuel Forbis, M.D. (Tulane, 1959).

Richard Dorn Jordan, M.D. (Univ. of North Carolina, 1961).

During the first two years, radiology is not taught as a separate course but is correlated in many of the established teaching programs. In the first year, this occurs in anatomy, clinical pathology and Physical diagnosis and in the second year in collaboration with the clinical services. Therapeutic radiology is taught in a similar manner. Particular emphasis is given during tumor clinics and conferences. The radioisotope division teaches mainly on the postgraduate level.

X-Ray Elective. This particular aspect concerns the application of roentgenology to clinical diagnosis. In this phase the student will spend the entire working day in the Department of Radiology to observe the various departmental members in their activities. Thus the student will participate in the fluoroscopic studies of the G. I. tract and

the heart and lungs, and will follow through certain of the angiographic studies. He will audit routine film readings and thereby participate intimately in the various solved and unsolved problems which arise daily within the department. He will attend the various departmental conferences held in conjunction with numerous other clinical divisions. This is limited to 3 to 5 students for a period of 9 weeks, 5 days a week. All quarters except summer. Radiology Staff.

X-Ray Diagnosis. This course will explore systematically the pathodynamics of roentgen changes as these particular aberrations relate to clinical medicine. This general systems review emphasizes the cardiovascular, pulmonary, and abdominal areas. Certain basic principles will be stressed with no attempt to encompass the entire fields of diagnosis. Two one-hour sessions each week for 9 weeks. Preferably limited to 15 to 20 students to allow significant time for discussion. All quarters except summer. Radiology Staff.

Pediatric Radiology. This course is for students and pediatric house staff who wish more experience in the Radiological Study of Pediatric disease. Daily examination of all films of patients is done with clinical and radiological opinions given and special instruction to the students on the service. The primary emphasis is on the value of radiological studies in making a more definitive clinical diagnosis. One hour daily, 4 times per week for 9 weeks. To be given all quarters. Drs. Reeves and Capp.

Radiation Therapy. This course provides additional experience in the study and treatment of malignant disease and certain benign conditions. The interest does not lie solely in therapy. The best interests of the patient are considered in the individual case problems discussed. The role of consultation and care for every cancer patient is stressed and the cooperation of radiologists and surgeons is impressed. Each day's work consists of a general discussion of one area at a time and, when possible, patient demonstrations. This is a one-hour seminar weekly for 9 weeks. All quarters. Drs. Cavanaugh, Worde, Raben, and Reeves.

SURGERY

David C. Sabiston, Jr., M.D. (Johns Hopkins, 1947), *Professor of Surgery and Chairman of the Department.*

Clarence E. Gardner, Jr., M.D. (Johns Hopkins, 1928), *Professor of Surgery and Chairman Emeritus of the Department.*

Deryl Hart, M.D. (Johns Hopkins, 1921), *Emeritus Professor of Surgery and President Emeritus of Duke University.*

Barnes Woodhall, M.D. (Johns Hopkins, 1930), *Professor of Neurosurgery; Vice Provost in Charge of Medical Affairs.*

William G. Anlyan, M.D. (Yale, 1949), *Professor of Surgery and Dean of the School of Medicine.*

Edwin P. Alyea, M.D. (Johns Hopkins, 1923), *Professor of Urology and Emeritus Chief of the Division of Urologic Surgery.*

W. Banks Anderson, M.D. (Johns Hopkins, 1924), *Professor of Ophthalmology, and Emeritus Chief of the Division of Ophthalmology.*

Lenox D. Baker, M.D. (Duke, 1933), *Professor of Orthopaedic Surgery and Chief of the Division of Orthopaedic Surgery.*

Joseph W. Beard, M.D. (Vanderbilt, 1929), *James B. Duke Professor of Surgery in Charge of Experimental Surgery and Associate Professor of Virology.*

Saul Boyarsky, M.D. (Vermont, 1946), *Professor of Urology; Director of Urologic Research and Assistant Professor of Physiology.*

Ivan W. Brown, Jr., M.D. (Duke, 1940), *Professor of Surgery.*

John E. Dees, M.D. (Virginia, 1933), *Professor of Urology.*

Sara J. Dent, M.D. (Med. Coll. of South Carolina, 1945), *Professor of Anesthesiology.*

Watt W. Eagle, M.D. (Johns Hopkins, 1925), *Professor of Otolaryngology and Emeritus Chief of the Division of Otolaryngology.*

Nicholas G. Georgiade, M.D. (Duke, 1949), D.D.S. (Columbia, 1944), *Professor of Plastic, Maxillofacial and Oral Surgery.*

James F. Glenn, M.D. (Duke, 1953), *Professor of Urology and Chief of the Division of Urologic Surgery.*

J. Leonard Goldner, M.D. (Nebraska, 1943), *Professor of Orthopaedic Surgery.*

Keith S. Grimson, M.D. (Rush Med. Coll., 1933), *Professor of Surgery.*

Guy L. Odom, M.D. (Tulane, 1933), *Professor of Neurosurgery and Chief of the Division of Neurosurgery.*

Kenneth L. Pickrell, M.D. (Johns Hopkins, 1935), *Professor of Plastic and Maxillofacial Surgery and Chief of the Division of Plastic and Maxillofacial Surgery.*

Raymond W. Postlethwait, M.D. (Duke, 1937), *Professor of Surgery, Chief of Surgical Service, Durham V.A. Hospital.*

Will C. Sealy, M.D. (Emory, 1936), *Professor of Thoracic Surgery and Chief of the Division of Thoracic Surgery.*

James H. Semans, M.D. (Johns Hopkins, 1936), *Professor of Urology.*

William W. Shingleton, M.D. (Bowman Gray, 1943), *Professor of Surgery and Chief of the Division of General Surgery.*

C. Ronald Stephen, M.D. (McGill, 1940), *Professor of Anesthesiology and Chief of the Division of Anesthesiology.*

Joseph A. C. Wadsworth, M.D. (Duke, 1939), *Professor of Ophthalmology and Chief of the Division of Ophthalmology.*

W. Glenn Young, Jr., M.D. (Duke, 1948), *Professor of Surgery.*

D. Bernard Amos, M.D. (Guys, London, England, 1951), *Associate Professor of Experimental Surgery and Professor of Immunology.*

Robert A. Bonar, Ph.D. (California, 1953), *Associate Professor of Biophysics.*

Frank W. Clippinger, M.D. (Washington Univ., 1952), *Associate Professor of Orthopaedic Surgery.*

Marcus L. Dillon, M.D. (Duke, 1948), *Associate Professor of Surgery; Chief of Thoracic Surgery, Durham V.A. Hospital.*

Robert A. Gregg, M.D. (Med. Coll. of South Carolina, 1948), *Associate Professor of Physical Medicine and Coordinator of Rehabilitation.*

Kenneth D. Hall, M.D. (Duke, 1956), *Associate Professor of Anesthesiology.*

William R. Hudson, M.D. (Bowman Gray, 1951), *Associate Professor of Otolaryngology and Chief of the Division of Otolaryngology.*

William C. North, M.D. (Northwestern, 1950), *Associate Professor of Anesthesiology and Assistant Professor of Pharmacology.*

William P. J. Peete, M.D. (Harvard, 1947), *Associate Professor of Surgery.*

Norman F. Ross, D.D.S. (Temple, 1937), *Associate Professor of Dentistry and Chief of the Division of Dentistry.*

Galen W. Quinn, D.D.S. (Creighton, 1952), M.S. (Tennessee, 1955), *Associate Professor of Orthodontics.*

W. Banks Anderson, Jr., M.D. (Harvard, 1956), *Assistant Professor of Ophthalmology.*

Frank H. Bassett, III, M.D. (Louisville, 1957), *Assistant Professor of Orthopaedic Surgery and Associate in Anatomy.*

Ronald W. Chen, Ph.D. (California, 1957), *Assistant Professor of Experimental Surgery; Biochemistry Research Laboratory, Durham V.A. Hospital.*

George B. Ferguson, M.D. (Jefferson, 1932), *Assistant Professor of Endoscopy and Laryngology.*

John W. C. Fox, M.D. (Univ. of Lausanne, Switzerland, 1953), *Assistant Professor of Anesthesiology.*

Donald D. Greenwood, Ph.D. (Harvard, 1960), *Assistant Professor of Otolaryngology; Assistant Professor of Physiology and Assistant Professor of Psychology.*

Patrick D. Kenan, M.D. (Duke, 1959), *Assistant Professor of Otolaryngology.*

C. Herschel King, M.D. (Maryland, 1956), *Assistant Professor of Anesthesiology.*

Norman Kirshner, Ph.D. (Pennsylvania State, 1952), *Assistant Professor of Experimental Surgery and Assistant Professor of Biochemistry.*

Maurice Alan Lesage, M.D. (Paris, France, 1949), *Assistant Professor of Experimental Surgery.*

George E. Lynn, Ph.D. (Northwestern, 1958), *Assistant Professor of Audiology in the Division of Otolaryngology.*

Donald E. McCollum, M.D. (Bowman Gray, 1953), *Assistant Professor of Orthopaedic Surgery.*

Blaine S. Nashold, M.D. (McGill, 1954), *Assistant Professor of Neurosurgery.*

Delford L. Stickel, M.D. (Duke, 1953), *Assistant Professor of Surgery.*

W. E. Cowell Taylor, M.D. (Glasgow Univ., Scotland, 1938), *Assistant Professor of Surgery; Chief of Staff, Durham V.A. Hospital.*

George T. Tindall, M.D. (Johns Hopkins, 1952), *Assistant Professor of Neurosurgery; Chief of Neurosurgical Service, Durham V.A. Hospital.*

Donald Silver, M.D. (Duke, 1955), *Assistant Professor of Surgery.*

Wirt W. Smith, M.D. (Texas, 1951), *Assistant Professor of Experimental Surgery.*

William R. Wentz, D.D.S. (Pittsburgh, 1952), *Assistant Professor of Orthodontics.*

Leon P. Woods, M.D. (Oklahoma, 1956), *Assistant Professor of Surgery; Chief of General Surgery, Durham V.A. Hospital.*

Dorothy W. Beard, R.N. (Vanderbilt, 1929), *Associate in Surgery and Research Associate in Experimental Surgery.*

M. Bourgeois-Gavardin, M.D. (Paris, France, 1945), (Duke, 1955), *Adjunct Associate in Anesthesiology.*

Everett I. Bugg, Jr., M.D. (Johns Hopkins, 1937), *Associate in Orthopaedics.*

Raphael W. Coonrad, M.D. (Duke, 1947), *Associate in Orthopaedics.*

Robert H. Cress, M.D. (Vanderbilt, 1953), *Associate in Physical Medicine and Rehabilitation, Chief of Physical Medicine and Rehabilitation, Durham V.A. Hospital.*

John Glasson, M.D. (Cornell, 1943), *Associate in Orthopaedics.*

William F. Hollister, M.D. (Duke, 1938), *Associate in Surgery; Chief of General and Thoracic Surgery, Moore County Hospital, Pinehurst, N. C.*

John C. Kouns, D.D.S. (Emory, 1937), *Associate in Dentistry; Chief of Dental Service, Durham V.A. Hospital.*

E. A. Cecil Lloyd, M.D. (London, England, 1951), *Associate in Anesthesiology; Chief of Anesthesiology, Durham V.A. Hospital.*

Raymond Massengill, Jr., M.S. (Tennessee, 1959), *Associate in Medical Speech Pathology.*

Samuel D. McPherson, M.D. (Johns Hopkins, 1943), *Associate in Ophthalmology.*

Baxter B. Sapp, D.D.S. (Temple, 1951), *Associate in Dentistry.*

H. Max Schiebel, M.D. (Johns Hopkins, 1933), *Associate in Surgery.*

Nathan Schupper, D.D.S. (Pittsburgh, 1932), *Associate in Dentistry; Assistant Chief of Dental Service, Durham V.A. Hospital.*

Ralph E. Snider, D.D.S. (Ohio State, 1948), *Associate in Dentistry; Staff Dentist of Dental Service, Durham V.A. Hospital.*

Vartan N. Vartanian, M.D. (Cluj. Roumania, 1951), (Duke, 1961), *Associate in Anesthesiology.*

Raymond C. Bender, Ph.D. (Cornell, 1931), *Research Associate in Surgery.*

Ruth Georgiade, M.A. (Duke, 1950), *Research Associate in Surgery.*

Ursula I. Heine, Ph.D. (Berlin, Germany, 1953), *Research Associate in Experimental Surgery.*

Peregrina C. Labay, M.D. (Univ. of St. Thomas, 1954), *Research Associate in Urologic Surgery.*

Ted A. Maag, D.V.M. (Univ. of Georgia, 1962), *Research Associate in Surgery.*

P. Ramschender Rao, Ph.D. (Tennessee, 1963), *Research Associate in Experimental Surgery.*

Marguerite Alberta Thiele, A.B. (Duke, 1944), *Research Associate in Thoracic Surgery.*

Rosemarie B. Zischka, Ph.D. (Univ. of Vienna, 1963), *Research Associate in Experimental Surgery.*

Leslie C. Meyer, M.D. (Nebraska, 1943), *Lecturer in Orthopaedics; Orthopaedic Surgeon, Shriners' Hospital for Crippled Children, Greenville, S. C.*

George R. Miller, M.D. (Rochester, 1943), *Lecturer in Orthopaedics; Associate Surgeon, N. C. Orthopaedic Hospital, Gastonia, N. C.*

Oscar L. Miller, M.D. (Emory, 1912), *Lecturer in Orthopaedics; Orthopaedic Surgeon, Charlotte Memorial Hospital, Charlotte, N. C.*

William McK. Roberts, M.D. (Tufts, 1925), *Lecturer in Orthopaedics; Surgeon-in-Chief, N. C. Orthopaedic Hospital, Gastonia, N. C.*

Frank H. Stelling, M.D. (Med. Coll. of Georgia, 1938), *Lecturer in Orthopaedics; Chief Surgeon, Shriners' Hospital for Crippled Children, Greenville, S. C.*

Delos W. Boyer, M.D. (George Washington, 1950), *Instructor in Orthopaedics, Danville, Va.*

Mary B. Campbell, R.N. (St. Luke's, 1937), *Instructor in Anesthesiology and Chief Nurse Anesthetist.*

Gordon M. Carver, Jr., M.D. (Duke, 1947), *Instructor in Surgery.*

James E. Davis, M.D. (Pennsylvania, 1943), *Instructor in Surgery.*

Hugo L. Deaton, M.D. (Columbia, 1957), *Instructor in Surgery.*

James R. Fortune, B.S. (North Carolina State, 1935), *Instructor in Audiology.*

Robert E. Musgrave, M.D. (Tennessee, 1946), *Instructor in Orthopatdics, Danville, Va.*

Carl N. Patterson, M.D. (Maryland, 1944), *Instructor in Otolaryngology.*

Eva O. Reese, R.N. (Duke, 1955), *Instructor in Perimetry.*

Larry Turner, M.D. (Duke, 1939), *Instructor in Ophthalmology.*

Shankar N. Kapoor, M.D. (King George's Med. Coll., Lucknow, India, 1935), *Assistant in Orthopaedics.*

Thomas C. Kerns, Jr., M.D. (Duke, 1950), *Assistant in Ophthalmology.*

Fellows

William H. Atwill, M.D. (Virginia, 1960), *Fellow in Experimental and Clinical Urologic Surgery.*

Robert L. Fuson, M.D. (Indiana, 1961), *Fellow in Surgery.*

Sushil S. Lacy, M.D. (Christian Med. Coll., India, 1959), *Fellow in Surgery.*

Gordon F. Moor, M.D. (Nebraska, 1959), *Fellow in Surgery.*

Kimiyoshi Tsuji, M.D. (Tokyo Med. Coll., Japan, 1957), *Fellow in Surgery.*

Enzo Zotti, M.D. (Padua, Italy, 1958), *Fellow in Thoracic Surgery.*

Residents

Lubin F. Bullard, Jr., M.D. (Duke, 1953), *Resident and Instructor in Ophthalmology.*

David L. Brown, M.D. (New York Med. Coll., 1959), *Resident and Instructor in Anesthesiology.*

William R. Caviness, D.D.S. (North Carolina, 1963), *Resident and Instructor in Oral Surgery.*

Brett B. Gutsche, M.D. (Rochester, 1961), *Resident and Instructor in Anesthesiology.*

Robert E. Hammonds, M.D. (Med. Coll. of Georgia, 1958), *Resident and Instructor in Otolaryngology.*

James R. Harp, M.D. (Duke, 1961), *Resident and Instructor in Anesthesiology.*

Lowell M. Hill, M.D. (Stanford, 1960), *Resident and Instructor in Orthopaedic Surgery.*

Ivey Jacobs, M.D. (Med. Coll. of Georgia, 1952), *Resident and Instructor in Otolaryngology.*

William R. Jones, M.D. (Pennsylvania, 1959), *Resident and Instructor in Urologic Surgery.*

Cooper D. Kunkle, M.D. (Virginia, 1956), *Resident and Instructor in Ophthalmology.*

James M. Lee, M.D. (Duke, 1958), *Resident and Instructor in Surgery.*

David S. Levenson, M.D. (Michigan, 1958), *Resident and Instructor in Ophthalmology.*

M. Stephen Mahaley, M.D. (Duke, 1959), *Resident and Instructor in Neurosurgery.*

James K. Mitchell, Jr., M.D. (Emory, 1957), *Resident and Instructor in Otolaryngology.*

William J. Pitts, M.D. (Vanderbilt, 1954), *Resident and Instructor in Plastic Surgery.*

John W. Reeves, M.D. (Duke, 1955), *Resident and Instructor in Surgery.*

Lloyd H. Robertson, Jr., M.D. (Duke, 1960), *Resident and Instructor in Urologic Surgery.*

William T. Weaver, M.D. (Duke, 1958), *Resident and Instructor in Surgery.*

Assistant Residents

Anthony Acinapura, M.D. (Georgetown, 1963), *Assistant Resident in Surgery.*

Agustin Aguilar, M.D. (Puebla, Mexico, 1953), *Assistant Resident in Anesthesiology.*

E. Warner Ahlgren, M.D. (Buffalo, 1962), *Assistant Resident in Anesthesiology.*

Dale P. Armstrong, M.D. (Michigan, 1958), *Assistant Resident in Plastic Surgery.*

James E. Auer, M.D. (Iowa, 1963), *Assistant Resident in Surgery.*

Quincy A. Ayscue, M.D. (North Carolina, 1963), *Assistant Resident in Anesthesiology.*

Fe B. Ballesteros, M.D. (Santo Thomas, 1961), *Assistant Resident in Anesthesiology.*

Jesse A. Burnam, M.D. (North Carolina, 1963), *Assistant Resident in Surgery.*

William C. Butterfield, M.D. (Yale, 1959), *Assistant Resident in Surgery.*

Milton F. Campbell, M.D. (Duke, 1961), *Assistant Resident in Ophthalmology.*

C. Porter Claxton, Jr., M.D. (Virginia, 1961), *Assistant Resident in Surgery.*

Robert E. Cline, M.D. (Duke, 1963), *Assistant Resident in Surgery.*

George R. Cousar, Jr., M.D. (Duke, 1960), *Assistant Resident in Ophthalmology.*

Clyde B. Cox, Jr., M.D. (Johns Hopkins, 1959), *Assistant Resident in Surgery.*

Ronald F. Crown, M.D. (George Washington, 1962), *Assistant Resident in Orthopaedic Surgery.*

William F. Deverell, M.D. (Buffalo, 1958), *Assistant Resident in Orthopaedic Surgery, Shriners' Hospital for Crippled Children, Greenville, S. C.*

Jan G. deWaal, M.D. (Amsterdam, Holland, 1956), *Assistant Resident in Orthopaedic Surgery.*

J. McNeely DuBose, M.D. (Johns Hopkins, 1959), *Assistant Resident in Surgery.*

William G. Edwards, M.D. (Southern California, 1959), *Assistant Resident in Orthopaedic Surgery.*

Robert D. Ensor, M.D. (Ohio, 1961), *Assistant Resident in Surgery.*

Richard C. Estes, M.D. (Georgia, 1961), *Assistant Resident in Urologic Surgery.*

H. Gene Ewy, M.D. (Johns Hopkins, 1959), *Assistant Resident in Surgery.*

Joseph C. Farmer, Jr., M.D. (Duke, 1958), *Assistant Resident in Surgery.*

Donald C. Ferlic, M.D. (Johns Hopkins, 1961), *Assistant Resident in Orthopaedic Surgery.*

Robert J. Flemma, M.D. (Rochester, 1960), *Assistant Resident in Surgery.*

Lynn Fort, M.D. (Duke, 1960), *Assistant Resident in Surgery.*

Elisabeth J. Fox, M.D. (Kings Coll. Hosp., Univ. of London, England, 1955), *Assistant Resident in Anesthesiology.*

William S. Garrett, Jr., M.D. (Harvard, 1955), *Assistant Resident in Plastic Surgery.*

Emile L. Gebel, M.D. (Duke, 1962), *Assistant Resident in Ophthalmology.*

Thomas L. German, M.D. (Texas, 1960), *Assistant Resident in Orthopaedic Surgery, Shriners' Hospital for Crippled Children, Greenville, S. C.*

Thomas R. Giblin, M.D. (Emory, 1955), *Assistant Resident in Plastic Surgery.*

Joe I. Gillespie, M.D. (Vanderbilt, 1961), *Assistant Resident in Otolaryngology.*

Ruedi P. Gingrass, M.D. (Michigan, 1958), *Assistant Resident in Plastic Surgery.*

Maria J. Gomez, M.D. (Madrid, Spain, 1962), *Assistant Resident in Anesthesiology.*

Robert P. Goodman, M.D. (Vanderbilt, 1962), *Assistant Resident in Surgery.*

Charles T. Harris, Jr., M.D. (Virginia, 1951), *Assistant Resident in Anesthesiology.*

Brack G. Hattler, Jr., M.D. (Cornell, 1961), *Assistant Resident in Surgery.*

Paul E. Henson, M.D. (Georgia, 1961), *Assistant Resident in Urologic Surgery.*

H. Barrett Heywood, III, M.D. (Emory, 1960), *Assistant Resident in Orthopaedic Surgery, North Carolina Orthopaedic Hospital, Gastonia, N. C.*

Carol C. Hogg, M.D. (Baylor, 1962), *Assistant Resident in Anesthesiology.*

William M. Hull, Jr., M.D. (Duke, 1963), *Assistant Resident in Ophthalmology.*

E. Darrell Jervey, M.D. (Duke, 1961), *Assistant Resident in Ophthalmology.*

John P. Kapp, M.D. (Duke, 1962), *Assistant Resident in Neurosurgery.*

Julian D. Kelly, Jr., M.D. (Virginia, 1959), *Assistant Resident in Orthopaedic Surgery, Durham V.A. Hospital.*

David M. Knize, M.D. (Texas, S.W., 1963), *Assistant Resident in Orthopaedic Surgery.*

J. Fletcher Lee, M.D. (Duke, 1960), *Assistant Resident in Neurosurgery.*

William B. Lehmann, M.D. (Yale, 1963), *Assistant Resident in Surgery.*

Clinton R. Lincoln, M.D. (Med. Coll. of Virginia, 1960), *Assistant Resident in Orthopaedic Surgery, Watts Hospital, Durham, N. C.*

Louis H. McCraw, M.D. (Mississippi, 1963), *Assistant Resident in Surgery.*

Richard P. McCullough, M.D. (Creighton, 1958), *Assistant Resident in Orthopaedic Surgery.*

Andrew H. McElroy, Jr., M.D. (Med. Coll. of Alabama, 1958), *Assistant Resident in Anesthesiology.*

F. Maxton Mauney, Jr., M.D. (Duke, 1959), *Assistant Resident in Surgery.*

Fred W. Miller, M.D. (Washington, 1958), *Assistant Resident in Plastic Surgery.*

Richard A. Mladick, M.D. (Northwestern, 1959), *Assistant Resident in Plastic Surgery.*

Michael T. O'Neil, M.D. (Nebraska, 1963), *Assistant Resident in Orthopaedic Surgery.*

David L. Pearsey, M.D. (Baylor, 1962), *Assistant Resident in Otolaryngology.*

Marvin Pomerantz, M.D. (Rochester, 1959), *Assistant Resident in Surgery.*

John M. Porter, M.D. (Duke, 1962), *Assistant Resident in Surgery.*

William H. Prioleau, M.D. (Virginia, 1960), *Assistant Resident in Surgery.*

Baer I. Rambach, M.D. (Louisiana, 1957), *Assistant Resident in Orthopaedic Surgery.*

William C. Rhangos, M.D. (Columbia, 1957), *Assistant Resident in Orthopaedic Surgery, Durham V.A. Hospital.*

Daniel W. Rose, M.D. (Virginia, 1960), *Assistant Resident in Otolaryngology.*

David S. Royal, M.D. (Tulane, 1960), *Assistant Resident in Anesthesiology.*

James C. Seabury, Jr., M.D. (Duke, 1960), *Assistant Resident in Urologic Surgery.*

William A. Shearin, M.D. (Duke, 1962), *Assistant Resident in Ophthalmology.*

Michael P. Small, M.D. (Louisville, 1962), *Assistant Resident in Urologic Surgery.*

Bobby L. Smith, M.D. (Virginia, 1953), *Assistant Resident in Anesthesiology.*

Edward J. Starinchak, M.D. (Ohio, 1963), *Assistant Resident in Orthopaedic Surgery.*

Milton M. Stephens, M.D. (Texas, S.W., 1962), *Assistant Resident in Orthopaedic Surgery.*

Deryl G. Stowe, M.D. (Duke, 1962), *Assistant Resident in Otolaryngology.*

Edgar E. Strong, III, M.D. (Med. Coll. of South Carolina, 1951), *Assistant Resident in Anesthesiology.*

Lawrence K. Thompson, III, M.D. (Duke, 1961), *Assistant Resident in Surgery.*

John H. Trant, III, M.D. (Duke, 1961), *Assistant Resident in Ophthalmology.*

Roger G. Vieth, M.D. (Duke, 1959), *Assistant Resident in Neurosurgery.*

J. Latane Ware, M.D. (Med. Coll. of Virginia, 1959), *Assistant Resident in Plastic Surgery.*

Carl H. Weber, Jr., M.D. (Duke, 1960), *Assistant Resident in Surgery.*

Robert H. Wilkins, M.D. (Pennsylvania, 1959), *Assistant Resident in Neurosurgery.*

Walter G. Wolfe, M.D. (Temple, 1963), *Assistant Resident in Surgery.*



Interns

Benjamin L. Allen, Jr., M.D. (Duke, 1964), *Intern in Surgery.*
Robert W. Anderson, M.D. (Northwestern, 1964), *Intern in Surgery.*
John Angelillo, D.D.S. (St. Louis, 1957), *Intern in Oral Surgery.*
Norman Cooper, M.D. (Zurich, Switzerland, 1964), *Intern in Surgery.*
Sewell H. Dixon, Jr. (Emory, 1964), *Intern in Surgery.*
James C. A. Fuchs, M.D. (Johns Hopkins, 1964), *Intern in Surgery.*
Andrew J. Gabor, M.D. (Duke, 1964), *Intern in Surgery.*
Don R. Goffinet, M.D. (Stanford, 1964), *Intern in Surgery.*
Frederick L. Grover, M.D. (Duke, 1964), *Intern in Surgery.*
Arned L. Hinshaw, M.D. (Duke, 1963), *Intern in Surgery.*
James W. Holsinger, M.D. (Duke, 1964), *Intern in Surgery.*
William R. Hudgins, M.D. (Mississippi, 1964), *Intern in Surgery.*
Victor J. Keranen, M.D. (Duke, 1963), *Intern in Surgery.*
William A. Leitner, M.D. (Med. Coll. of Alabama, 1964), *Intern in Surgery.*
Robert A. Mathog, M.D. (New York Univ., 1964), *Intern in Surgery.*
Ralph McGraw, Jr., M.D. (Duke, 1964), *Intern in Surgery.*
George F. Schmitz, M.D. (Duke, 1964), *Intern in Surgery.*
Donald G. Slaughter, M.D. (Duke, 1964), *Intern in Surgery.*
Charles E. Virgin, M.D. (Duke, 1964), *Intern in Surgery.*

Required Course

The required course in surgery is given during the second year for a seven week period. Students will be assigned patients on the surgical wards for diagnosis and management. In this course attention will be directed toward basic principles in surgery including diagnostic methods and pre and post operative care. Dr. Sabiston, and Surgical Staff.

Elective Courses

Basic Clinical Surgery. This course is designed to teach the basic principles and concepts of surgery, including surgical physical diagnosis and diagnosis of the acute abdomen, and will include the diseases of the gastrointestinal tract, endocrine organs, proctology, and surgery of hernia. Primary emphasis will be on diagnosis, and students may assist in various operative procedures. The course is nine weeks and will be offered twice yearly. Limited to 10 students. Drs. Shingleton and Peete.

Survey of Pulmonary, Esophageal, and Cardiovascular Surgery. This course is a continuation of the students' clinical clerkship with emphasis on thoracic disease. The student will be assigned patients and will be responsible for the clinical history, physical examination, and the preoperative studies. He will scrub at the time of operation and will assist in his postoperative care. Attendance is required at daily rounds with the staff. Assigned reading in this field will be required of each student. The course will require the students' full time

for nine or eighteen weeks. All quarters. The course will be limited to 5 students. Drs. Sabiston, Sealy, Brown, Young, and Resident Staff.

Surgical Aspects of Pulmonary Disorders. The student will be given a more detailed study of pulmonary disease. There will be three parts to the course. The first will be clinical with assignment of one patient per week for examination and follow-up. The student will be required to search the recent literature concerning the patient's problem and include a brief summary of pertinent references with each. The second part will be concerned with clinical pulmonary function measurements in patients with pulmonary disorders and will be conducted by Dr. H. O. Sieker of the medical service. This will require two afternoons per week, 4 hours each. The student will be expected to participate in actual measurements of pulmonary function in patients coming to this laboratory, and will be assigned required reading relating to this phase of physiology. In the third phase the student will be assigned to the animal laboratory for 4 hours per week. He will be expected to carry out such studies as the effects of hypercapnia, hypoxia on respiratory function; and the effect of paradoxical chest motion, pneumothorax and bronchial obstruction on cardiopulmonary function. Duration of course, full time, nine weeks, limited to 3 students. Drs. Sealy, Young, Brown, Lesage, and Resident Staff.

Surgical Cardiology. The student will be introduced to the various aspects of the surgical treatment of cardiovascular disease and the course is divided into three component parts. First will come the introduction into the techniques of diagnosis, and two periods each week will be spent either in the pediatric or medical cardiovascular laboratory assisting in the clinical evaluation of patients. The student will be taught the basic concepts of extracorporeal circulation by assisting in the operating room with the conduction of open heart operations. In the second part clinical studies will be afforded by examination and follow-up of the patients. At the time of discharge the student will be expected to render a summary of the patient's hospital stay, with a list of pertinent references in recent surgical literature concerning the patient's condition. The third portion will be laboratory exercises in surgical cardiology. This will consist of studies of heart action during open chest, the effect of hypercapnia, hypoxia on heart action, techniques for resuscitation of the heart, and studies of the various types of apparatus used to obtain cardiopulmonary by-pass. In addition, the students will be expected to carry out the various measurements of blood gases and to be familiar with these techniques. Duration of course, nine weeks, two days of 4 hours each per week in the cardiopulmonary laboratory; and 4 hours (one day per week) in the animal laboratory. The remainder of the time will be spent in the operating

room and in the care of patients. Number of students 2 to 4. Drs. Sabiston, Sealy, Brown, Young, Lesage, and Resident Staff.

Neoplastic Diseases in Surgical Practice. This course is designed for study of patients with a variety of tumors, including those of the gastrointestinal tract, soft tissue sarcomas, melanoma, and carcinoma of the thyroid and other endocrine glands. The students will assist in operations on these patients, as well as in their pre and post operative care, and will be allowed to follow patients with these diseases in the private and public outpatient clinics. Diagnosis of malignant tumors and methods of treatment other than chemotherapy will be stressed. The course is nine weeks and will be offered once yearly. Limited to 5 students. Drs. Shingleton, Postlethwait and Peete.

Chemotherapy of Malignant Tumors. This course teaches basic approaches to chemotherapy of cancer. It includes lectures three times weekly in which systematic presentation of the chemotherapeutic agents, their biochemistry and mode of action are presented. The student will have a laboratory exercise in experimental transplantable tumor in animals including treatment with a chemotherapeutic agent. The clinical application of chemotherapeutic agents in the management of cancer, as studied in patients in the private-public surgical outpatient clinics, will give the student first-hand knowledge of the clinical application of these drugs. The course continues for nine weeks and will be offered once yearly. Limited to 8 students. Drs. Shingleton, Byrne, Laszlo, and Mahaley.

Homotransplantation of Organs. This course will acquaint students with certain basic immunological aspects of homotransplantation of organs and will provide certain background information related to basic concepts in transplantation of tissues and organs. The course is nine weeks and will be offered once yearly. Drs. Stickel and Amos.

Surgical Diseases of Peripheral Blood Vessels and Lymphatics. This course will acquaint the student with newer techniques and diagnosis and management of peripheral vascular disease, including diseases of the arteries and veins and of the lymphatics. The students will assist in the performance of such diagnostic procedures as lymphangiography and angiography. They will be assigned ward patients with these diseases and will follow such patients in the surgical outpatient clinics. The course is nine weeks and will be offered once yearly. Limited to 5 students. Drs. Silver and Anlyan.

Surgery for Hypertension and Arteriosclerotic Disease. This course covers broad aspects of essential hypertension, drugs, sympathectomy, renal vascular hypertension, pheochromocytoma, adrenal cortical tumors, and diseases of the cerebral, coronary, renal and aortic vessels caused by arteriosclerosis and requiring direct arterial

surgery. Students will be assigned to the diagnostic laboratories to study patients with these diseases and to participate in their diagnosis and assist at the time of operation. Students will be assigned to the outpatient clinic to view the postoperative results achieved in these patients. The course is nine weeks and will be offered once yearly. Limited to 6 students. Dr. Grimson.

Surgery of Trauma. This course teaches the principles and practice of diagnosis and management of the acutely traumatized patient. Students will be assigned to the Duke Hospital Emergency and Recovery Rooms and will assist in diagnosis and treatment of assigned patients with acute injuries. Lectures and seminars will be held in a coordinated plan to cover trauma of general surgery. The course is nine weeks and will be offered once yearly. Limited to 5 students. Drs. Postlethwait, Shingleton, and Peete.

Basic General Surgery. This course is designed to include the basic aspects of the major surgical diseases, and is given at the Veterans Hospital. Patients will be assigned to the students and time provided to assist at operations. The major emphasis, however, will be on physiologic and pathologic changes, diagnosis, and the indications for operation in these diseases. Special attention will be given to those subjects in surgery common to all medical practices such as the acute abdomen. Full time, nine weeks. All quarters except summer. Minimum 10 and maximum 20 students. Drs. Postlethwait, Dillon, Woods and Resident Staff.

Surgical Subspecialties. This course is designed to give a reasonably thorough study of the surgical subspecialties and is given at the Veterans Hospital. Ophthalmology, Otolaryngology, Neurosurgery, Orthopaedics, Plastic Surgery and Urology. Patients on these services will be assigned to the students and an opportunity provided to assist at operation. Emphasis, however, will be given to diagnosis and pathophysiologic alterations. Full time, nine weeks. All quarters except summer. Minimum 10 and maximum 20 students. Drs. Boyarsky, McCollum, Tindall and Resident Staff.

Pediatric Surgery. The principles of diagnosis and management of surgical diseases of the newborn and of surgical childhood diseases. Students will be assigned to surgical patients on the children's ward for participation in their diagnosis and management of surgical disease. A coordinated group of lectures will cover the general aspects of pediatric surgery. The course will run for nine weeks and will be offered once yearly. Limited to 5 students. Dr. Silver and selected members of the Surgical Staff.

Medical and Surgical Renal Disease. This course will combine experience and instruction in medical and surgical diseases of the kid-

ney and urinary tract, and will be taught jointly by the Division of Urologic Surgery and the Division of Medical Renal Diseases. Students will participate in the pyelonephritis clinic, hypertension clinic, and general urology clinic. Teaching rounds will embrace clinical and experimental problems in renal function, ehmodialysis, renal transplantation, urinary infections, renal hypertension, obstructive uropathies, nephritides and other congenital and acquired diseases of the urinary tract which are of mutual concern to the internist and urologist. Eight hours, 5 days weekly; nine weeks. Offered twice yearly. Limited to 6 students. Drs. Glenn, Robinson, Gunnells, Boyarsky, Peschel, and E. Anderson.

Investigative Urology. Selected students are given an opportunity to participate in an established program of urologic investigation, dealing with physiology and pathology of the genitourinary system. Both independent and integrated research will be encouraged. Methods and techniques of experimental animal surgery will be taught, and students will be afforded an opportunity to accomplish renal, ureteral, vesical and urinary diversion, renal hypertension, pediatric urology, and urologic endocrinepathies. Students with interest in any area of clinical surgery are encouraged to participate. Four hours, 6 days weekly; nine weeks. Offered continuously. Limited to 4 students. Drs. Glenn, Dees, and Staff.

Basic Neurosurgery Course. Those disease conditions which are commonly encountered in a neurosurgical practice are presented. A clinical presentation of a common neurological disorder such as brain tumor, head injury, etc., is made by a member of the staff in neurosurgery. Clinical features and a plan of diagnostic investigation are stressed. The clinical disorder is then used as a focal point from which to carry the presentation into the basic science area related to the clinical problem. For example, the neuropathologist will discuss the pathology of brain tumors after the clinical features of the condition have been covered by the neurosurgery staff. Occasionally, related clinical disciplines will discuss the clinical problem being presented. Two hours each week. Duration of course, nine weeks. Offered three times each year. Limited to 20 students. Neurosurgery Staff and Staff of related subspecialties including Neuropathology, Neuroanatomy, Neurology, Neuroendocrinology.

Clinical Neurosurgery. This course is designed for those students with future interest in the neurological sciences. The student becomes in practice an extern on neurosurgery as he rotates through the neurosurgical service with essentially the same responsibilities as an intern. Duties include the work-up and care of inpatients, work-up of clinic patients, assistance in the operating room, routine post operative care, daily rounds, and night call. The student is expected to

attend the weekly conference in neurology, neuropathology, and neuroradiology, and the neurosurgery lecture given to the house staff at 8:00 a.m. each Saturday morning. During this period, each student is required to write a thesis based on a clinical subject. Course is full time for a nine week period. Limited to 2 students each nine week period. Dr. Odom and Neurosurgery Staff.

Investigative Neurosurgery. In this course the student is assigned a project relating to the neurological sciences and is provided with the technical help, recording equipment, and experimental animals necessary for its completion. This course specifically will *not* make the student into just another lab assistant. Instead, each student plans and executes his own individual project, with the help of the neurosurgery staff. Laboratory space is available and clinical and experimental research projects in neurophysiology and cerebrovascular physiology are currently in progress. The student is expected to attend weekly conferences in neurology, neuroradiology, and neuropathology, and the weekly neurosurgery lecture given to the house staff at 8:00 a.m. each Saturday morning. Course is full time for a given period. To be offered three times a year for 18 weeks. Limited to 2 students each 18 week period. Dr. Odom and Neurosurgical Staff.

General Ophthalmology. Participation in regular House Staff activities, including instruction in the use of such specialized apparatus as the slit lamp, indirect ophthalmoscope, retinoscope, perimeter, and phoropter afford an overall view of the specialty. Each student will spend a part of each day assisting in the operating room or in the clinic and will be expected to attend Ophthalmology teaching rounds. The course will run full time for nine weeks and will be open to not more than 2 students for each nine week period. Dr. Anderson, Jr.

Medical Ophthalmology. Ophthalmic signs and symptoms of systemic diseases are presented by means of illustrated lectures and by the opportunity to examine suitable patients. Of interest to students in any field of clinical medicine, this course requires skill only with the direct ophthalmoscope. Emphasis is on the diagnosis of systemic diseases by recognition of their ocular manifestations. Four hours once weekly for nine weeks. Limited to 20 students. Dr. Anderson, Sr.

Basic Ophthalmic Sciences. A postgraduate course designed primarily for those intending to specialize in Ophthalmology, this course covers optics, ocular anatomy, ocular physiology, ocular pathology, ocular pharmacology, and the physical basis of photocoagulation, radiotherapy, and enzyme therapy. Undergraduates must obtain permission to register from a member of the Ophthalmology Senior Staff. Given each Tuesday night (7:30-9:30 p.m.) during the academic year (September through May). Any number of students. Dr. Anderson, Jr.,



and the Ophthalmology Staffs of N. C. Memorial and McPherson Hospitals.

Refraction. The purpose of this course is to train the students to become an adequate if not adept refractionist. Instruction in the use of the phoropter, astigmatic dials, lensometer, trial lens sets, and retinoscope is given. Full time (8 hours daily) for nine weeks. Limited to one student each period. Dr. Anderson, Sr.

Neuro-Ophthalmology. Experience is provided in the application of ophthalmic diagnostic techniques to the diagnosis of central nervous system diseases. Instruction in perimetry, Lancaster motor field testing, use of the amblyoscope, stereocampimetry, ophthalmodynamometry, and measurement of ocular muscle imbalances is given. After instruction in these techniques the student will assist in the examination of patients with central nervous system problems. By arrangement with the Divisions of Neurology or Neurosurgery, course time may be split with either of these specialties. Eight hours Tuesdays and Thursdays for nine weeks. Limited to one student each period. Dr. Anderson, Jr.

Ophthalmic Pathology. Once weekly the student reviews the ophthalmic pathology specimens submitted the preceding week and assists in collecting the case histories for presentation at the monthly Ophthalmic Pathology Conference. Prerequisites for this course are either the course in General Ophthalmology or the course in Basic Ophthalmic Sciences. Four hours weekly for 18 weeks. Limited to one student. Drs. Anderson, Jr., and Klintworth.

General Otolaryngology. This is a clinical otolaryngology course. The students participate in the outpatient clinic activities and in the management of patients in the hospital. They are expected to participate in the work-up and management of patients admitted to the Otolaryngology Service and to assist in the operating room. Participation in the Otology Program acquaints the student with audiometric techniques. Diagnosis and management of head and neck cancer will be covered and the student will attend the Head and Neck Cancer Clinic in the Division of Radiation Therapy. Each student will be required to submit a paper dealing with some aspect of Otolaryngology. This course would be especially valuable to those interested in Neurosurgery, Ophthalmology, Neurology or Pediatrics. Full time, nine weeks. To be given every nine week period. Limited to one to two students. Drs. Greenwood, Kenan and Hudson.

Medical Audiology and Speech Pathology. Students will primarily be working in the Hearing and Speech Clinic. Special attention will be given to advanced audiometric techniques including instruction in the use of the Bekesey and PGSR audiometry. Emphasis will also be placed on vestibular mechanisms and testing. The student will also

spend some time with the speech pathologist observing methods of diagnosis and management of the various speech problems. Contact with clinical Otolayrngology will be maintained. Four hours, 5 times a week for nine weeks. Given every nine week period. Limited to one to two students. Drs. Lynn and Massengill.

Otophysiology Lecture Series. This course is didactic and will be offered to the residents as well as to students. Lectures on auditory and vestibular physiology will be given. The Department of Psychology will participate in this lecture series particularly emphasizing psychoacoustics and conditioned responses. In all probability this course will be given in the evenings. It will be primarily aimed toward Otolayrngology residents and graduate students in Psychology but any number of interested medical students will be accepted. One hour weekly for 18 weeks, given once yearly. No limit to number of students. Drs. Greenwood, Diamond and Hudson.

Otolaryngology Lecture Series. In this one or two hours weekly lecture series general Otolaryngology will be covered with the emphasis on clinical aspects. This will be entirely a didactic lecture course and at the conclusion an examination will be given. This lecture course will be essentially the same course as offered now to senior students. One hour per week for 18 weeks. To be given two times yearly. No limit to number of students. Drs. Hudson and Kenan.

Reconstructive Plastic Surgery. This course would give the interested student a concentrated course in reconstructive surgery—the equivalent of an intern; operating, emergency and dressing rooms, clinics—private and public, ward assignments, lectures, demonstrations, etc. This course would include patients with the following conditions: congenital malformations of the face, hands, recto-genital systems, acute facial and peripheral trauma, burns, paraplegics, esthetic surgery, cancer of the face, oral cavity and neck, reconstructive surgery following trauma and disease. One student can be accommodated on a full time basis for each nine weeks. Drs. Pickrell, Georgiade and Plastic Surgery Staff.

Physiology and Bacteriology of Healing Wounds. This course is designed for the student who is interested in the physiology and bacteriology of healing wounds. The student is assigned to the dressing rooms daily, Monday through Friday, where he has an abundant opportunity to study the bacteriology and physiology of healing wounds—acute trauma, following excisional surgery and following many types of grafting and reconstructive procedures. The effects of various antiseptics and local applications of emollients could be studied in conjunction with their possible bacteriocidal or bacteriostatic effects. Four hours (8:00 a.m. to 12 noon) 5 times a week for nine weeks. Limited to 1 student for each nine weeks. Drs. Pickrell, Georgiade, and Plastic Surgery Staff.

Speech and Hearing Problems in Children with Clefts of the Lip and Palate. The student who is interested in speech and hearing problems in children, especially as they relate to children with clefts of the lip and palate, is given an abundant opportunity to learn and work in the Speech and Hearing Laboratories and the Child Guidance Clinic. Methods of evaluation, testing and remedial measures would be studied intensely. Three hours (2:00 p.m. to 5:00 p.m.) 5 times a week for nine weeks. Limited to one student. Drs. Massengill (speech); Lynn and Hudson (audiology); Quinn and Wentz (orthodontics); Pickrell, Georgiade and Staff (plastic and reconstructive surgery).

Anesthesiology—Applied Physiology and Pharmacology. This course will allow application of the principles of respiratory and cardiovascular physiology to therapeutic practice in patients. By means of lecture-demonstrations, followed by direct participation, students will evaluate and discuss: (1) physiologic techniques of ventilation, (2) the efficacy of various mechanical ventilators, (3) the value of respiratory resuscitation, (4) the importance of cardiac resuscitation, (5) the significance of therapeutic and diagnostic nerve blocks, (6) the actions of anesthetic drugs, (7) the effects of vasopressor and cardiac stimulant drugs, and (8) the action of analeptic drugs. Three hours, 5 times a week for nine weeks. To be given twice a year. Limited to 10 students. Entire anesthesia staff.

Anesthesiology—Principles and Practice. This course is an introduction to the role of the anesthesiologist in the care of hospitalized patients. It includes: (1) six weeks of active administration of clinical anesthesia under direct, close supervision with the student actively evaluating the responsibilities of the anesthesiologist, and familiarizing himself with the techniques and drugs employed, (2) one week in the Recovery Room and in exposure to obstetric anesthesia, observing, diagnosing, and treating immediate postoperative complications, and participating in methods of pain relief for obstetric delivery, (3) one week in Inhalation Therapy Division evaluating the practical aspects of oxygen administration, and utilization of mechanical ventilators for acute and chronic therapy, (4) one week in Anesthesia laboratory practicing techniques of monitoring vital signs (blood pressure, venous pressure, respiration, electrocardiogram, electroencephalogram, means of determining pH, pCO_2 and pO_2 of blood and respired gases) utilizing such modern techniques as infrared analyzers, chromatography, and specific electrodes. Experiments will illustrate resuscitative techniques and hazards of certain drug combinations. Full time for nine weeks. To be given each quarter. Limited to 8 students. Entire anesthesia staff.

Anesthesiology Research. This course teaches techniques utilized in clinical and laboratory research in anesthesiology. In collaboration with the faculty, the student will work on a research project related to the physiology or pharmacology of anesthetic practice. A wide range of facilities is available for the measurement of respiratory and circulatory parameters, both in animals and in man. Full time for nine weeks. To be given each quarter. Limited to 2 students. Drs. North, Hall, and Stephen.

Medical Speech Pathology. This course will emphasize diagnostic and rehabilitation treatment used with the patients who will be seen in the Medical Center. The following conditions will be reviewed: articulation disorders, delayed speech development, cleft palate, stuttering, voice disorders, aphasia, cerebral palsy, language disorders, mental retarded speech, lisping, oral inaccuracy, laryngectomy, and other disorders of speech not falling under one certain category. The role the physician plays in the total rehabilitation of the speech-impaired patient will be stressed. Three hours four times a week for nine weeks. All quarters. Dr. Massengill.

Research in Medical Speech Pathology as Applied to Reconstructive Plastic Surgery. This course is designed to present a composite analysis of research techniques used by the speech pathologist with reconstructive plastic surgery patients that possess organic speech problems. Certain emphasis will be placed on cinefluorographic investigation and speech results achieved by different surgical procedures. The use of different speech appliances will also be reviewed. The course will deal with the organization and administrations of speech pathology research programs coordinated with reconstructive surgery departments. Three hours four times a week for nine weeks. All Quarters. Dr. Massengill.

General Orthopaedics. This course is a comprehensive introduction to Orthopaedic Surgery designed primarily to broaden the student's understanding of the specialty. It consists of full or part-time experience in the Orthopaedic service, daily contact with the staff and house officers, and duties similar to those of the junior intern including care of in-patients, out-patient experience, and work in the operating room. The student attends all conferences and rounds, has an opportunity to visit with staff members at the State Crippled Children Clinics in various areas of North Carolina, and to observe the participation of the State and local Health and Welfare Departments and Vocational Rehabilitation Counselors in a well-established rehabilitation program with close personal contact of those participating with each agent fully familiar with the problems. Emphasis is placed on the care of the patient, however, part-time experience with Orthopaedic Fellows in Anatomy and Pathology is available. The overall purpose of the course is to develop

a broad concept of Orthopaedics, particularly for those students planning a career in general practice or pediatrics, to teach practical techniques to those students interested in allied surgical specialties, and to give those students interested in Orthopaedics as a specialty an opportunity to evaluate all phases of such a career. Time, flexible, part or full-time, 4 to 9 weeks. Limited to 4 students. Orthopaedic staff.

Office Orthopaedics. An introduction to out-patient Orthopaedic problems, patient examination, disability evaluation, and the management of compensation-liability problems and establishment of medico-legal contact with emphasis on record-keeping and office management. Half time, five afternoons per week, limited to four students. Associated staff in practice in Durham and Duke staff.

Orthopaedics in the Community Hospital. This course is similar to those above, with more emphasis on the private practice of Orthopaedics, especially as an office consultation service in a community including the coordinating of office practice, emergency room, and hospital services. This course is conducted in the offices of the Associate Orthopaedists in Durham and at Watts and Lincoln Hospitals. Time, flexible, 4 to 9 weeks. Limited to 4 students. Drs. Bugg, Glasson, Coonrad, and Kapoor.

Cerebral Palsy. Opportunities are available in this field both for clinical experience and laboratory investigation in cerebral palsy and general children's Orthopaedics. The course is given at the North Carolina Cerebral Palsy Hospital and the Duke University Medical Center. Students participate in rehabilitation and occupational therapy and diagnostic conferences and rounds, with opportunity to observe psychological evaluation of the handicapped and the handling of family problems. In addition, the student observes and assists in the surgical care, bracing, and rehabilitation of these patients. Time, flexible, part or full-time, 4 to 9 weeks.

Adequate Fellowships with full support are available through the United Cerebral Palsy Foundation both for clinical work and investigation. Time, 9 weeks, full time.

Clinical Conferences in Cerebral Palsy. These Conferences are arranged for the benefit of students primarily interested in neurological diseases, pediatrics, and related fields. This part-time opportunity is available throughout the year. 11:00 a.m. to 12:00 noon on Mondays and 10:00 a.m. to 12:00 noon on Wednesdays at the North Carolina Cerebral Palsy Hospital. Dr. Baker, Dr. Bassett, and N.C.C.P.H. Staff.

Surgery of the Hand. This course is a part-time clinical experience emphasizing didactic and functional anatomy of the hand, evaluation of the injured upper extremity and reconstructive hand surgery.

Opportunity to carry out investigation, particularly clinical surveys, is available if desired. Schedule is flexible. The course is limited to 2 students, 9 to 18 weeks. Dr. Goldner.

Orthopaedic Aspects of Arthritis. A clinical experience in adult and children's rheumatology in conjunction with the Department of Medicine. The student attends rheumatology conferences, rounds, and clinic. Opportunity is available for investigative work through the rheumatology program. (See Rheumatology under Medicine.) Surgical experience can be arranged through Dr. McCollum. Time can be arranged according to the student's interests and desires. Dr. McCollum and Medical Rheumatology Staff.

Athletic Medicine. The course stresses the importance of the care of playground high school and college athletic injuries. The course content, although dealing with Orthopaedic and traumatic problems, is directed at preparing doctors who plan to practice general medicine or surgery and think they would enjoy participating in their community's school programs. In addition to the specific Orthopaedic and traumatic therapy, lectures and experience in conditioning dieting, protective equipment, prevention and care of athletic injuries, will be included. Practical experience will be available in the training rooms of the Duke University Department of Athletics and on the athletic fields at the University and the local high schools. Limited to 2 students, half-time. Given during the first and second quarters, 9 weeks. Approximately 3 afternoons a week plus Friday evenings and Saturday afternoons. Drs. Baker, Clippinger, Bassett, and the Physical Education Staff.

Electromyography. This course is an introduction to electrodiagnosis techniques and theories and practice of clinical electromyography. It consists of lectures, patient, and laboratory demonstrations. Individual projects directed at the study of specific diseases of the neuromuscular system may be arranged. The course is given each term for 9 weeks, limited to 4 students for one hour per week. Additional time can be arranged for special projects. Dr. Clippinger.

Research in Orthopaedics. This course gives the student an opportunity to spend part or full time in laboratory investigation or clinical research in Orthopaedics and related fields. In the main it will consist of individual projects with experience in investigations currently in progress in Orthopaedics at the Medical Center, Veterans Administration Hospital, and the North Carolina Cerebral Palsy Hospital. Hours and length of study, of necessity, are flexible and vary from time to time and according to available projects and the student's interest and desire. Orthopaedic Staff.

Rehabilitation of the Amputee. In this course the student's training is directed at developing a full knowledge of the basic principles of amputation, post-operative care, and psychological adjustment,

through weekly Amputee Clinics at the Duke University Medical Center, the Durham Veterans Administration Hospital, and the Veterans Administration Regional Office in Winston-Salem. Special training is offered in the mechanics of prosthetics, their manufacturing, and instruction in prescription, fitting, and theories of their use. The experience is offered in the Orthotics and Prosthetic Shop, Physical and Occupational Therapy, Rehabilitation, and Vocational Placement. Three half-days per week for 9 to 18 weeks. Drs. Goldner and Clippinger, Mr. Titus, Miss Kaiser, and the Duke Prosthetic Shop and Physical Therapy Staffs. Limited to 4 students.

Introduction to Fractures. This course offers the student an opportunity to participate in the emergency and follow-up care of fractures at the Duke Medical Center and Watts and Lincoln Hospitals, where, by special arrangement, he may be on emergency call. In addition, he attends and participates in Fracture and Plaster Clinics and ward rounds, at the Medical Center on Friday a.m., at Watts Hospital on Saturday a.m. Extent of participation by special arrangement. Time is flexible. Limited to 4 students. Medical Center and Watts Orthopaedic Staffs.

Children's Orthopaedics. This course is directed primarily at acquainting students interested in Orthopaedics or Pediatrics in the basic problems associated with congenital abnormalities and other Orthopaedic problems of childhood. In addition to the experience available at the North Carolina Cerebral Palsy Hospital and Duke University Medical Center, student internships are available at the North Carolina Orthopaedic Hospital and at the Shriners' Hospital for Crippled Children. For those students particularly interested in children's Orthopaedics, the internships are available for 9, 18, or 36 weeks on a full-time basis with opportunity to participate in all the activities at the hospitals. The student internships are particularly recommended for those interested in Pediatrics.

In addition, by special arrangement, one student at a time may attend any or all of the following Crippled Children's Clinics sponsored each month by the Chrippled Children's Division of the North Carolina State Board of Health as follows:

1st Thursday—Roanoke Rapids—Drs. Bugg and Coonrad
1st Friday—Lumberton, followed by visit to McCain Hospital—Drs. Goldner and Clippinger
2nd Friday and the Saturday following the 2nd Friday—Clinton and Morehead City respectively—Drs. Baker and Bassett
3rd Thursday—Goldsboro—Dr. Roberts of the North Carolina Orthopaedic Hospital and Drs. Goldner and McCollum
3rd Thursday—Halifax—Drs. Bugg and Coonrad
Friday following 3rd Thursday—Ahoskie—Drs. Baker and McCollum
Last Friday—Wilson—Drs. Baker and Bassett

By special arrangement, more than one student may attend any or all of the above Clinics.


ABSOLUTELY NO SMOKING
IN THE CHAMBER
AT ANY TIME !!

UNDERGRADUATE CANCER TRAINING PROGRAM

(Supported by a grant-in-aid from the USPHS)

W. W. Shingleton, M.D. (Bowman Gray, 1943), *Chairman*
Albert G. Smith, M.D. (Washington Univ., 1947), *Coordinator*

The Cancer Undergraduate Training Program is designed to improve the teaching of cancer to undergraduate medical students. Special teaching and demonstration on tumors is started during the student's course in Pathology and is continued into the clinical years. All clinical departments provide clinics, conferences and seminars which are designed to provide in depth an understanding of the nature, diagnosis, natural history and treatment of malignant tumors. In addition, special seminars with outstanding cancer authorities from other institutions in the country are arranged annually. Selected staff members in the various clinical departments are involved in teaching in this program, which is continuous throughout the medical school year.

The student is instructed in cancer problems by ward assignments, tumor clinics for the undergraduate student, and special lectures and courses given by various departments. During the third year, the student studies ward patients with a clinical instructor from the departments of surgery, obstetrics and gynecology or pediatrics. The student participates in all phases of the care of patients with cancer (diagnosis, pre- and post-operative care, and assisting in the operation). He observes the lesion in situ, examines it in the fresh state, follows the specimen through the pathologic laboratory, and studies the prepared slides for microscopic appearance, thereby learning pathology techniques and checking on the accuracy of his own diagnosis. Interdepartmental tumor clinics offer combined teaching by the pathologist, radiologist, surgeon, gynecologist and pediatrician, and teach the student the techniques and value of each of these disciplines, as well as giving the student a comprehensive review of the special cancer problems. Special courses given by the radiology and pathology departments teach the use and value of diagnostic and therapeutic x-ray and diagnostic surgical pathology in handling the cancer patient.

The training program is supplemented by a tumor registry where accurate follow-up records are kept with the results summarized and made available to staff and students. Thus they can know the year by year results of treatment of large numbers of patients as expressed in percentages of those (1) free of recurrence, (2) apparently cured, (3) having a recurrence, or (4) dead of recurrence at varying times after onset of the disease and the institution of therapy.

VETERINARY MEDICINE

John C. LeMay, D.V.M. (Georgia, 1959), *Assistant Professor of Veterinary Medicine and Director of the Department.*

Nickolas J. Sojka, B.S., D.V.M. (Kansas, 1958), *Associate in Veterinary Medicine.*

The function of this Department is to facilitate the various teaching and research programs that require laboratory animals. Veterinary medical consultation is provided for research projects in which experiments are conducted on animals. Assistance is made available in selecting the most suitable species or strain of laboratory animal to use in a given study. In addition, animals are procured, quarantined and appropriately conditioned in order to provide a highly reliable biological tool. A wide variety of technical services are carried on, such as providing whole blood of a variety of species, collecting biological specimens, providing clinical pathologic examinations, preparing animals for surgery, post-surgical care, and maintenance of the animal colonies.

The department collaborates with those departments of the School of Medicine that utilize laboratory animals in their teaching programs. Various disease states are experimentally produced in animals for student observation and study and techniques for collecting of biological specimens for additional study are demonstrated. Aid is given in setting up and carrying out these demonstrations and studies on animals.

A post-doctoral training program in laboratory animal medicine has been initiated and plans are under way to increase the number of available training positions.

Although the department is in an early stage of development, research is under way on some of the spontaneous diseases of laboratory animals.

Duke Hospital

ADMINISTRATIVE STAFF

Charles H. Frenzel, A.B. (Duke, 1941), *Administrative Director and Professor of Hospital Administration.*

Louis E. Swanson, A.B. (Hamline, 1941), *Assistant Administrative Director and Associate Professor of Hospital Administration.*

Charles C. Boone, A.B. (Duke, 1951), *Assistant Administrative Director and Instructor in Hospital Administration.*

Ralph E. Jennings, B.A., B.S. (East Tennessee State, 1954), *Assistant Administrative Director and Instructor in Hospital Administration.*

Stanley W. Elwell, B.S. (Iowa State, 1955), *Director of Out Patient Department.*

George B. Kantner, B.S. (Pennsylvania State, 1940), *Personnel Director.*

James W. Anderson, B.B.A. (Miami, 1951), C.P.A. (1955), *Business Officer.*

Paul W. Aitken, A.B. (Morris Harvey, 1951), B.D. (Duke, 1955), Th.M. (Duke, 1961), *Chaplain.*

PRIVATE DIAGNOSTIC CLINIC STAFF

Clarence H. Cobb, Ph.G. (Univ. of North Carolina, 1933), *Business Manager, Medical Division.*

Roy N. Crenshaw, *Business Manager, Surgical Division.*

Ralph Hawkins, B.S. (Univ. of North Carolina, 1957), *Assistant Business Manager, Medical Division.*

H. D. Maynard, B.S., M.A. (Univ. of North Carolina, 1947, 1949), *Assistant Business Manager, Surgical Division.*

George A. Whiteside, B.S. (Univ. of North Carolina, 1956), *Assistant Business Manager, Medical Division.*

TECHNICAL STAFF AND HEADS OF HOSPITAL DIVISIONS

William Arthur Gay, B.A. (Richmond Professional Inst., 1957), *Administrative Assistant and Unit Administrator.*

Dorothy Ellen Tate, B.S., M.S. (Pennsylvania State, 1946, 1952), *Director and Associate Professor of Dietetics.*

I. Thomas Reamer, Ph.G. (Maryland, 1924), *Pharmacist and Associate in Pharmacy.*

Betty W. Kernodle, R.R.L., A.B. (Duke, 1940), *Assistant Medical Record Librarian.*

Lelia R. Clark, R.N. (Mt. Sinai, 1932), B.S. (Columbia, 1947), M.A. (Columbia, 1948), *Director, Nursing Service and Professor of Nursing.*

Helen L. Kaiser, R.P.T. (Harvard, 1921), *Director and Associate Professor of Physical Therapy.*

Bert R. Titus, C.P., C.O., *Director and Assistant Professor of Orthosis and Prosthesis.*

Elon H. Clark, *Director and Professor of Medical Art and Illustration.*

Martha J. Scoggins, *Executive Housekeeper.*

Cecil Carden, *Supervisor, Printing Department.*

Leatrice B. Emory, *Supervisor, Electrocardiographic and Basal Metabolic Laboratory.*

Warren E. Wagner, *Manager, Storeroom.*

Preston W. Smith, *Supervisor, Private Medical Laboratory and Technical Associate in Laboratory Science.*

Edward T. Parrish, *Manager, Laundry.*

Bernice A. Belue, B.S. (Alabama, 1948), O.T.R. (Washington Univ., 1956), *Director of Occupational Therapy.*

Gretchen J. Cheek, R.N. (Duke, 1934), *Central Supply Services.*

Margaret Ann W. Watson, R.N. (Univ. of Pennsylvania Hosp., 1959), *Acting Supervisor, Operating Rooms.*

C. Ronald Stephen, M.D. (McGill, 1940), *Anesthesiologist and Professor of Anesthesiology.*

Richard G. Lester, M.D. (Columbia, 1948), *Professor of Radiology and Chairman of the Department.*

Aaron P. Sanders, M.S. (Rochester, 1952), Ph.D. (Univ. of North Carolina, 1964), *Director, Isotope Laboratories and Assistant Professor of Radiology and Biophysics.*

Ivan W. Brown, M.D. (Duke, 1940), *Director, Blood Bank and Professor of Surgery.*

Ralph E. Thiers, Ph.D. (Toronto, 1947), *Director, Clinical Chemistry Laboratories, and Associate Professor of Biochemistry.*

Suydam Osterhout, M.D. (Duke, 1950), Ph.D. (Rockefeller Inst., 1959), *Director, Microbiology Laboratories, and Assistant Professor of Microbiology.*

INTERNSHIPS AND RESIDENCIES

Straight internships of one year duration are available in Medicine, Surgery, Pathology and Pediatrics, and two mixed internships are offered in Obstetrics and Pediatrics. Appointments are from July 1 through June 30 with few exceptions. Interns receive a stipend of $220.00 per month, with uniforms and laundry of uniforms provided.

The Residencies offered, with the Chairman of each service, are as follows:

Internal Medicine	(Chm.)	Eugene A. Stead, Jr., M.D.
Dermatology		J. Lamar Callaway, M.D.
Neurology		Albert Heyman, M.D.
Obstetrics and Gynecology	(Chm.)	Roy T. Parker, M.D.
Pathology	(Chm.)	Thomas O. Kinney, M.D.
Pediatrics	(Chm.)	Jerome S. Harris, M.D.
Pediatric Allergy		Susan C. Dees, M.D.
Pediatric Cardiology		Madison S. Spach, M.D.
Psychiatry	(Chm.)	Ewald W. Busse, M.D.
Radiology	(Chm.)	Richard G. Lester, M.D.
Surgery	(Chm.)	David C. Sabiston, Jr., M.D.
Anesthesiology		C. Ronald Stephen, M.D.
General Surgery		William W. Shingleton, M.D.
Neurosurgery		Guy L. Odom, M.D.
Ophthalmology		Joseph A. C. Wadsworth, M.D.
Oral Surgery		Nicholas G. Georgiade, M.D.
Orthopaedic Surgery		Lenox D. Baker, M.D.
Otolaryngology		William R. Hudson, M.D.
Plastic Surgery		Kenneth L. Pickrell, M.D.

Thoracic Surgery ..... W. C. Sealy, M.D.
Urologic Surgery ..... James F. Glenn, M.D.

Application forms and information for internships, residencies or available fellowships may be obtained by writing to the Chairman of Department, Duke University Medical Center, Durham, North Carolina. Both men and women graduates of any Class A Medical School are eligible for appointment. While internships are rarely available to graduates of medical schools outside the United States and Canada, a limited number of residencies and research fellowships are available from time to time in which case certification by E.C.F.M.G. (Educational Council on Foreign Medical Graduates, 1710 Orrington Avenue, Evanston, Illinois) is prerequisite.

Duke University Medical Center is a participating member of the National Intern Matching Program, 2530 North Ridge Avenue, Evanston, Illinois, and all applicants must register with this program. The Hospital is a member of the American Hospital Association, is approved by the American Medical Association for internship and residency training, and is fully approved by the Joint Commission on Accreditation of Hospitals.

The Duke University Medical Center is an integral part of Duke University which makes its educational, recreational and athletic facilities available for the Resident Staff.

The Durham Veteran's Administration Hospital adjoins the Duke University Campus, and is operated under the supervision of the Dean's Committee of the Duke University School of Medicine. The full time professional staff of the Veteran's Hospital are all members of the School of Medicine faculty. All training programs are integrated with corresponding programs at Duke University Medical Center, which includes rotating of House Officers to each hospital from time to time.

POSTGRADUATE STUDY

William M. Nicholson, M.D. (Johns Hopkins, 1931), *Professor of Medicine and Assistant Dean in Charge of Postgraduate and Continuing Education.*

Graduates in medicine are welcomed at the various specialty clinics in Medicine, Surgery, Obstetrics, and other specialties from 9:30 A.M. to 12:30 P.M. each morning except Sunday.

Ward rounds are given in Medicine in the mornings as general Out-Patient Clinics are in session in the afternoon. Throughout the entire year there are concentrated formal types of Postgraduate instruction in the way of Symposia and study groups. These include subjects for the generalist as well as for the various specialties. Announcements concerning these Symposia will be made from time to time.

Paramedical Courses

SCHOOL OF CYTOTECHNOLOGY

J. V. Klavins, M.D. (Kiel, 1948), *Professor of Pathology and Director of School of Cytotechnology.*

Nathan Kaufman, M.D. (McGill, 1941), *Professor of Pathology and Associate Director of School of Cytotechnology.*

Peteris Kalnins, C.T. (ASCP), Diplomat of the Institute of Physical Education of Latvia, 1925 (Equiv. of B.S.) and of Department of Schools of Latvia, 1935 (Equiv. of M.A.). *Technical Associate in Pathology, and teaching supervisor in School of Cytotechnology.*

Staff of Department of Pathology as required in special phases of instruction.

The School of Cytotechnology at the Department of Pathology offers a 12 month course in technical and diagnostic aspects of exfoliative cytology to qualified individuals. The minimum qualifications are 12 semester hours of biology, which may include anatomy, histology, zoology, botany, and physiology; and at least 2 years of college. The common practice is to admit individuals with B.S. or A.B. degrees and only in exceptional cases applicants with incomplete college requirements will be considered.

The program consists of two parts. Part I—6 months, primarily theoretical and practical exercise in the techniques of exfoliative cytology and interpretation of the clinical material. Part II—6 months practical training in all aspects of exfoliative cytology in participating in the routine work of the laboratory. One class is accepted annually on January 1. Graduates of this course are awarded a certificate and are eligible to take the certifying examinations given by the Registry of Medical Technologists of the American Society of Clinical Pathologists. There is no tuition fee. Additional information about the School of Cytotechnology and applications for admission may be obtained from J. V. Klavins, M.D., Department of Pathology, Duke University Medical Center, Durham, North Carolina.

DIETETICS

Dorothy Ellen Tate, B.S., M.S., *Director and Associate Professor of Dietetics.*

Mary Helen McLachlan, B.S., M.A., *Educational Director and Associate Professor of Dietetics.*

Mary Lou Pate, B.S., M.S., *Assistant Director and Instructor of Dietetics.*

Nancy Curtis, B.S., *Administrative Dietitian and Instructor in Dietetics.*

Charlotte Conely, B.S., *Therapeutic Dietitian.*

Hildreth Ferguson, B.S., *Therapeutic Dietitian.*

Elizabeth Roca, B.S., *Therapeutic Dietitian.*





Joanne Burleigh, B.S., *Therapeutic Dietitian.*
Catherine Wason, B.S., *Clinic Dietitian.*

A Dietetic Internship program is offered to men and women who have graduated from college in Food and Nutrition or Institutional Administration and meet the course requirements of the American Dietetic Association. The 12 months of post baccalaureate work consists of classroom instruction and clinical experience in administration, therapeutics, research and education. After the successful completion of the Dietetic Internship, certificates and membership into the American Dietetic Association are awarded. For further information write:

Department of Dietetics
Duke University Medical Center
Durham, North Carolina

HOSPITAL ADMINISTRATION

Ray E. Brown, B.S. (Univ. of North Carolina, 1937), M.B.A. (U. of Chicago, 1943), H.H.D. (Wake Forest Coll., 1958), *Director of Graduate Program in Hospital Administration and Professor of Hospital Administration.*

Charles H. Frenzel, A.B. (Duke, 1941), *Administrative Director, Medical Center and Professor of Hospital Administration.*

Louis E. Swanson, A.B. (Hamline, 1941), *Assistant Administrative Director and Associate Professor of Hospital Administration.*

Donald S. Smith, II, A.B. (Dartmouth, 1951), M.H.A. (Minnesota, 1953), *Program Coordinator and Assistant Professor of Hospital Administration.*

Charles C. Boone, A.B. (Duke, 1951), *Assistant Administrative Director and Instructor in Hospital Administration.*

Ralph E. Jennings, B.A., B.S. (East Tennessee State, 1954), *Assistant Administrative Director and Instructor in Hospital Administration.*

Richard A. Bindewald, A.B. (Furman, 1953), *Assistant to the Dean and Instructor in Hospital Administration.*

Clarence H. Cobb, Ph.G. (Univ. of North Carolina, 1933), *Business Manager, Medical Division and Instructor in Hospital Administration.*

Clinical Preceptors and Lecturers

E. C. Bryson, LL.B. (Oregon, 1937), *University Attorney and Professor of Law.*

Marshall I. Pickens, A.B. (Duke, 1925), M.A. (Duke, 1926), *Executive Director, Hospital and Orphan Sections, The Duke Endowment, and Associate in Hospital Administration.*

James R. Felts, Jr., *Assistant Executive Director, Hospital and Orphan Sections, The Duke Endowment, and Instructor in Hospital Administration.*

George P. Harris, A.B. (Duke, 1926), *Field Director, Hospital and Orphan Sections, The Duke Endowment, and Instructor in Hospital Administration.*

H. Carl Rowland, B.S. (Davidson, 1942), *Director, Planning and Design Service, Hospital and Orphan Sections, The Duke Endowment, and Instructor in Hospital Administration.*

B. G. McCall, B.S. (Clemson, 1950), *Director, Management Service, Hospital and Orphan Sections, The Duke Endowment, and Instructor in Hospital Administration.*

William F. Andrews, A.B. (Duke, 1948), *Administrator, Memorial Hospital of Wake County.*

Joseph E. Barnes, B.S. (Carnegie Tech., 1939), M.B.A. (Chicago, 1947), *Director, Rex Hospital.*

Harold L. Bettis, B.A. (Lenoir Rhyne, 1939), *Director, Moses H. Cone Hospital.*

John F. Moulton, B.A. (California, 1941), M.S. (Columbia, 1947), *Director, Watts Hospital.*

J. Minetree Pyne, B.S. (Univ. of North Carolina, 1940), *Administrator, Alamance County Hospital.*

Marvin E. Yount, Jr., A.B. (Duke, 1941), *Administrator, Memorial Hospital of Alamance County.*

Graduate education for hospital administration is offered through a 24-month program conducted jointly by the Graduate School of Arts and Sciences and the Medical Center. The Program consists of selected graduate courses in Economics, Political Science, Sociology, and Hospital Administration, and of a 12-month administrative residency in hospitals and other health agencies. The Master of Hospital Administration degree is awarded to those who successfully complete the Program.

Detailed information may be obtained from:

Graduate Program in Hospital Administration
Box 3018
Duke University Medical Center
Durham, North Carolina

MEDICAL ART AND ILLUSTRATION

Elon H. Clark, *Professor of Medical Art and Illustration.*

Robert L. Blake, *Associate in Medical Art and Illustration.*

Henry F. Pickett, *Associate in Medical Photography.*

Raymond L. Howard, *Instructor in Medical Photography.*

Leonard Hart, *Instructor in Medical Photography and Chief of Medical Illustration at Veterans Administration Hospital, Durham, N. C.*

The primary function of this division comprised of artists and photographers is to produce a wide variety of visual aids for members of the Medical Center staff. Due to the ever increasing need within the University, and as no similar service is available, this Division also offers its services to the University Faculty as a whole. The illustrations produced through art and photography are used for teaching aids (including exhibits), illustrating papers or books for publication, recording research data and enhancing hospital and administrative records. Services offered by this Division are: 1) Medical Art Section: Illustrations produced by various art methods and techniques, of subjects seen or unseen, and even the theoretical, limited only by the available equipment and talents of the artists. Services rendered: a) Schematic and

mechanical drawings, diagrams, charts, graphs, designs, lettering, signs, casts, models and exhibits, and b) many other forms of illustrations normally ascribed to an artist. 2) Medical Photography Section: Photographic illustrations through various photographic methods and techniques limited only by the available photographic equipment and the talents of the photographers. Services rendered: a) Still and motion pictures, pictures of the retinae, photographic copies, transparencies, film strips, lantern slides, enlargements, and contact prints, b) Medical Center staff and student pictures for administrative records are made by this section and c) many other forms of illustrations normally ascribed to a photographer.

Under the direction of this division, services offered directly to the patient are: Production of facial prostheses used to replace missing anatomical parts, and instruction in the use of opaque cosmetics used to cover skin discolorations.

Facilities for individual instruction in, or demonstration of specific techniques and methods employed by this division, as well as instruction in the proper use of standard projection equipment are available to students and faculty of the University. No academic credit is given. Prerequisites, fees, time and type of instruction will be determined by the Chairman of this Division. Duke University does not have a school of medical art or medical photography and this division does not offer any formal courses in these fields of endeavor.

MEDICAL TECHNOLOGY

Thomas D. Kinney, M.D. (Duke, 1937), *Professor of Pathology, Chairman of Pathology Department, and Director of School of Medical Technology.*

Beulah M. Ashbrook, B.S. (Murray State, 1955), M.A. (Duke, 1964), MT (ASCP) *Associate in Pathology, Registrar and Chief Instructor of School of Medical Technology.*

A. Wendell Musser, M.D. (Indiana, 1956), *Assistant Professor of Pathology and Chief of Laboratory Services, V.A. Hospital.*

Suydam Osterhout, M.D. (Duke, 1950), Ph.D. (Rockefeller Inst., 1959), *Assistant Professor of Microbiology, Associate in Medicine.*

Ralph E. Thiers, Ph.D. (Toronto, 1947), *Associate Professor of Biochemistry and Director of the Clinical Chemistry Laboratory.*

Charles P. Mengel, M.D. (Johns Hopkins, 1957), *Associate in Medicine.*

Felix J. Pircher, M.D. (Univ. of Innsbruck, Austria, 1939), *Assistant Professor of Radiology and Medical Director of Radioisotope Division.*

Preston W. Smith, *Instructor in Medical Technology and Technical Associate in Clinical Microscopy.*

Claude Harrison, B.S. (North Carolina Coll., 1958 and M.S. North Carolina Coll., 1964), *Instructor in Medical Technology.*

Catherine Oglesby, B.S. (Salem, 1957, MT (ASCP), *Instructor in Medical Technology.*

Suzanne Schrack, BSMT (Duke, 1958), MT (ASCP), *Instructor in Medical Technology.*



Norma Lester, B.A. (Lees McRae, 1954), MT (ASCP), *Instructor in Medical Technology.*

Margaret Beck, BSMT (Duke, 1957), MT (ASCP), *Instructor in Medical Technology.*

John W. Carr, B.S. (Guilford, 1955), *Instructor in Medical Technology.*

Carl Odell, B.S. (Univ. of North Carolina, 1964), *Instructor in Medical Technology.*

Martha W. Harris, MT (ASCP), *Instructor in Medical Technology.*

J. Phillip Pickett, H.T. (ASCP), *Instructor in Medical Technology and Technical Associate in Pathology.*

The School of Medical Technology offers a twelve-month internship program of instruction and rotation through the clinical laboratories of the Duke University Medical Center and the Veterans Administration Hospital.

The Internship program is open to men and women who have either a baccalaureate degree or a minimum of 3 years of college (in an accredited college or university) with plans for receiving such a degree from the preparatory college upon completion of the Internship program. Applicants must have successfully completed at least 90 semester (135 quarters) hours which include:

Chemistry: minimum of 16 semester hours (24 quarter hours) which includes one full year of general college chemistry. The remaining courses may be selected from qualitative, quantitative, organic, physical or biochemistry. (One semester of quantitative analysis is strongly recommended.) All courses must include lectures and laboratories.

Biological Sciences: minimum of 16 semester hours (24 quarter hours). All required biological sciences must include lecture and laboratories. Courses may be selected from general biology, zoology, botany, physiology, comparative anatomy, parasitology, histology, histologic technic, genetics or bacteriology. (Bacteriology is strongly recommended.)

Mathematics: minimum of 3 semester hours.

Courses in physics are recommended but not required. Electives may be selected from English, Social Sciences, Arts and Humanities.

Courses taught during the Internship include Clinical Biochemistry, Clinical Microscopy, Radioisotope theory, Microbiology (Bacteriology, Mycology, Virology), Immunohematology, Parasitology, Introduction to Clinical Pathology, Serologic technics and Histologic technics. (Classes begin on July 1.)

Students are given a certificate upon completion of the Internship program and are qualified for examination and certification by the Registry of Medical Technologists of the American Society of Clinical Pathologists. They are eligible for membership in the American Society of Medical Technologists. This program is approved by the Council

on Medical Education and Hospitals of the American Medical Association.

A $25.00 non-refundable registration fee is required upon acceptance in the program. This is applied towards the $50.00 breakage fee which is payable upon entrance. Students will be furnished rooms in dormitories and will receive a grant-in-aid of $100 a month. Students are required to participate in the Hospital Insurance plan, furnish their own white uniforms, white shoes, and meals. Laundry of uniforms is furnished by the Medical Center. Students can expect to spend $50-$75 for books during the year.

For further information and/or application blanks, write to: Registrar, School of Medical Technology, Department of Pathology, Duke University Medical Center, Durham, North Carolina 27706

NURSE ANESTHESIA

Charles Ronald Stephen, M.D.C.M., D.A., *Professor of Anesthesiology and Chief of Division of Anesthesiology.*

Mary B. Campbell, C.R.N.A., *Instructor in Nurse Anesthesia and Chief Nurse Anesthetist.*

Mary M. Gardner, C.R.N.A., *Educational Program Director.*

Leola A. Glenn, C.R.N.A., *Assistant Nurse Anesthetist.*

Frances R. Perry, C.R.N.A., *Assistant Nurse Anesthetist.*

Annie Mae Truitt, C.R.N.A., *Assistant Nurse Anesthetist.*

Mary P. Haigler, C.R.N.A., *Assistant Nurse Anesthetist.*

The twenty-four months course in anesthesia is available to well qualified registered nurses. Instruction embraces the theoretical aspects and clinical application of all drugs and techniques in accepted usage. The program is divided into quarters. The major part of the basic theoretical instruction is given during the first three quarters. After a preclinical period of eight weeks, clinical practice runs parallel with the theoretical program. One class is accepted annually and enrolled January 15. All appointments of the current year are made by September 1 of the preceding year. Graduates of this course are eligible to take the qualifying examination for membership in the American Association of Nurse Anesthetists. Tuition is $150.00. Additional information concerning nurse anesthesia may be obtained from Mary B. Campbell, C.R.N.A., P.O. Box 3204, Duke University Medical Center, Durham, North Carolina.

PHYSICAL THERAPY

Helen Kaiser, R.P.T., *Associate Professor of Physical Therapy and Director of Physical Therapy.*

Grace C. Horton, B.S., R.P.T., *Associate in Physical Therapy and Supervisor of Treatment Division.*

Eleanor M. Flanagan, A.B., M.A., R.P.T., *Assistant Professor in Physical Therapy.*


PLAYSKOOL
POSTAL STATION

Edna Blumenthal, B.S., *Associate in Physical Therapy.*
John Riebel, B.A., B.D., M.A., R.P.T., *Associate in Physical Therapy.*
Barbara Taylor, B.S., M.A., R.P.T., *Coordinator of Physical Therapy Education.*
Ann M. McCallum, B.S., R.P.T., *Secretary-Recorder for the Curriculum in Physical Therapy.*
Idell Parrish, B.S., R.P.T., *Coordinator for Extension Services in Physical Therapy.*
Jane Culbertson, B.S., R.P.T., *Assistant in Physical Therapy Extension Services.*
Emy Villanueva, B.S., R.P.T., *Instructor in Physical Therapy.**
* On leave 1964-1965.
Christine Thompson, B.A., R.P.T., *Instructor in Physical Therapy.*
Katherine W. LeGuin, B.A., R.P.T., *Instructor in Physical Therapy.*
Jo Abernathy, B.S., R.P.T., *Assistant in Physical Therapy.*
Judith Cantey, B.S., R.P.T., *Assistant in Physical Therapy.*
Lee Grabski, B.S., R.P.T., *Assistant in Physical Therapy.*
Sue Espenshade, B.A., R.P.T., *Instructor in Physical Therapy.*
Ann Thompson, A.B., R.P.T., *Assistant in Physical Therapy.*
Gladys Hart, B.S., R.P.T., *Assistant in Physical Therapy.*
Judy Hampton, B.S., M.A., R.P.T., *Assistant in Physical Therapy.*
Carolyn Palmer, A.B., R.P.T., *Assistant in Physical Therapy.*
Pamela Allen, B.A., R.P.T., *Assistant in Physical Therapy.*

The Curriculum in Physical Therapy at Duke University is conducted under the joint auspices of the Graduate School of Arts and Sciences and the Medical Center.

Two programs are offered: 1) The Program leading to a Certificate in Physical Therapy and a Master of Arts Degree. This is in two phases: (a) In the first year the necessary credit courses may be selected from the following: Anatomy M201, 6 units; M202, 3 units; M203, 4 units; M205, 2 units; M313-314, 2 units; Physiology M261-262, 8 units; Psychology S232, 3 units; M279, 1 unit; M370, 2 units; M372, 3 units; Biochemistry 201, 3 units; Zoology 252, 4 units; 245, 3 or 4 units; 271, 4 units. (b) In the second year in addition to the thesis, the physical therapy procedure courses listed in program two and practicum may be completed. Upon completion of the total two year program a Certificate in Physical Therapy and a Master of Arts Degree are awarded. 2) The Certificate Program. A baccalaureate degree or a plan for receiving such a degree from the preparatory college upon completion of the physical therapy program is essential for admission. The program includes basic science courses from those listed in program one in addition to courses in kinesiology, pathology, physical therapy and rehabilitation as related to the medical and surgical specialties, administration, ethics and physical therapy procedure courses. Sixteen weeks of clinical experience are provided on a rotation basis at Duke University Medical Center, affiliated hospitals, and state and county health departments. The entire curriculum including the practice may be completed in fifteen months.

Prerequisites for both programs are basic courses in psychology, mathematics through trigonometry, and one year laboratory courses in chemistry, a biological science exclusive of botany, and physics covering the principles of heat, mechanics and electricity. In addition, those undertaking the Master of Arts Program must meet the requirements of their selected major.

Tuition and health fees are $1,200 for the fifteen month's certificate program. For the program leading to a Master of Arts degree the cost is approximately $1,800. Scholarship and loan funds are available. Graduates of either program are eligible for state and national licensing and registration examinations and membership in the American Physical Therapy Association. For further information write to the Director of Physical Therapy, Box 3247, Duke University Medical Center, Durham, North Carolina.

RADIOISOTOPE TECHNOLOGY

Richard G. Lester, M.D. (Columbia, 1948), *Professor of Radiology and Chairman of the Department.*

Robert J. Reeves, M.D. (Baylor, 1924), *Professor of Radiology.*

George J. Baylin, M.D. (Duke, 1937), *Professor of Radiology.*

Felix J. Pircher, M.D. (Univ. of Innsbruck, 1939), *Assistant Professor of Radiology and Medical Director of Radioisotope Division.*

Aaron P. Sanders, M.S., Ph.D. (Univ. of North Carolina, 1964), *Assistant Professor of Radiology and Scientific Director of Radioisotope Division.*

Kathryn W. Sharpe, B.S. (Duke, 1960), *Instructor in Radiology (Radioisotope Division).*

Conrad M. Knight, B.S. (Norwich Univ., 1953), *Radiological Safety Officer of Duke University.*

The Radioisotope Division offers a three month training program of instruction and laboratory training for clinical radioisotope technicians, and a six month training program of instruction and laboratory training for research radioisotope technicians. This training includes work in all areas of the Radioisotope Division.

An applicant for admission must be a graduate of an approved high school and board certified (or eligible to take board examinations) in Medical Technology or X-ray Technology. Equivalent training and experience may be substituted for this requirement. A registration fee of $100 is required. This fee includes tuition, and diploma fee for the course. For further information address inquiries to: Mrs. Kathryn W. Sharpe, Instructor in Radiology (Radioisotope Division), Box 3166, Duke University Medical Center, Durham, North Carolina.

RADIOLOGIC TECHNOLOGY

Richard G. Lester, M.D. (Columbia, 1948), *Professor of Radiology and Chairman of the Department.*

Robert J. Reeves, M.D. (Baylor, 1924), *Professor of Radiology.*

George J. Baylin, M.D. (Duke, 1937), *Professor of Radiology and Associate in Anatomy.*

Boyd Thomas Worde, M.D. (Tennessee, 1947), *Associate Professor of Radiology.*

William Francis Barry, M.D. (Pennsylvania, 1946), *Associate Professor of Radiology.*

John A. Goree, M.D. (Duke, 1955), *Associate Professor of Radiology.*

Patrick J. Cavanaugh, M.D. (St. Louis, 1951), *Associate Professor of Radiology.*

M. Paul Capp, M.D. (Univ. of North Carolina, 1958), *Assistant Professor of Radiology.*

John B. Cahoon, R.T. (Duke, 1939), FASXT, *Assistant Professor of Radiologic Technology and Technical Director.*

Alice McCrea, M.S. (Univ. of Chicago, 1958), *Assistant Professor of Radiology and Radiation Physicist.*

Aaron P. Sanders, M.S., Ph.D. (Univ. of North Carolina, 1964), *Assistant Professor of Radiology and Director of Isotope Laboratory.*

Mary Jane Lockhart, A.B., R.T. (Duke, 1958), A.S.X.T., *Technical Instructor in Radiologic Technology.*

Frederick Ross Porter, R.T. (Duke, 1961), A.S.X.T., *Technical Instructor in Radiologic Technology.*

Conrad M. Knight, B.S. (Norwich Univ., 1953), *Director of Radiation Safety.*

The school of Radiologic Technology offers a two year training program of instruction and practical training in all divisions of the Department of Radiology. Students are admitted the first Wednesday in September for two years of intensive training in the academic and practical aspects of Radiologic and Therapeutic technique. During the second year the students are paid a stipend of $100.00 per month. Upon completion of the course the students are required to take the National Board Examinations in Radiologic Technology sponsored by the American Registry of Radiologic Technologists. The school is approved by the Council on Medical Education of the American Medical Association, the American College of Radiology, the American Registry of Radiologic Technologists and the American Society of Radiologic Technologists. Candidates for admission must be graduates of approved high schools and rank in the upper third of their class. Candidates with college credits are given preference. Official transcripts of high school and/or college grades, a list of three references and a recent photograph must be included with the application before being considered by the Committee on Admissions. It is recommended that the applicants be at least 19 years and not more than 30 years of age at the time of enrollment. Experience has shown that courses in physics, chemistry, biology, and physiology are very helpful in preparation for a career in Radiologic Technology. A personal interview is required before final selection of students is made. Full time attendance is required in both the classroom and practical work. Night and weekend call duty are required. Class periods are for one hour per day five days per week, September through May. The remaining time is spent on a

rotation schedule through all phases of technological activities. Periodic examinations are given as a test of progress. Students must maintain a satisfactory average in the academic and the practical aspects of the program to be awarded a diploma. Conferences are held on Thursday afternoons from September through May and various other conferences are scheduled from time to time. Clinical experience is done under supervision of full time registered x-ray technologists, staff radiologists and resident radiologists. Two weeks vacation and one week sick leave is allowed each year. Time lost in excess of this amount must be made up by the student. The course of study follows the approved syllabus of The American College of Radiology and The American Society of Radiologic Technologists. The number of hours devoted to most subjects however, far exceed the basic minimum requirements. A registration fee of $25.00 is required upon entrance and is payable to the Treasurer, Duke University, on the day of entrance. Books and supplies are about $100.00. No living quarters are provided for para-medical students by the University. Students live in town at their own expense. At the end of six months, if the student's work has been unsatisfactory or shows inaptitude for technical work in radiologic technology, he is advised to withdraw from the course. For further information write: John B. Cahoon, R.T., Technical Director, School of Radiologic Technology, Duke University Medical Center, Durham, North Carolina.

PROSTHETIC AND ORTHOPAEDIC APPLIANCES

Bert R. Titus, C.P., C.O., *Director and Assistant Professor of Orthotics and Prosthetics.*

Robert O. Gooch, C.P., *Assistant Prosthetist and Orthotist.*

Percy H. Ray, C.O., *Assistant Orthotist.*

The function of this department is to produce prosthesis and orthopaedic appliances for the medical profession. Facilities for individual training in specific techniques or methods employed by this department are available. Those who complete four years' training are eligible to take the examination of American Board of Certification.

Roster of Students

Class of 1968

*Abbey, Wallace Dare, Jr. (Ohio State U.), Columbus, Ohio.
Arons, Michael James (Yale), Stamford, Connecticut.
Atkinson, John Pepper (Emory), Macon, Georgia.
Baylin, Stephen Bruce (Duke), Durham, North Carolina.
Bickers, Peter Warren (U. of So. Fla.), Tampa, Florida.
Block, Michael Allen (Princeton), Irvington, New Jersey.
Brickman, Martin James (Bates Coll.), Marblehead, Massachusetts.
Carlton, Bruce Ronald (N.Y.U.), Great Neck, New York.
Cheek, Jack Allan, Jr. (U. of N.C.), Greensboro, North Carolina.
Chotiner, Gerald (Duke), McKeesport, Pennsylvania.
Cook, Joseph William, Jr. (Duke), Charlotte, North Carolina.
Crosson, Ann Ward (Randolph-Macon Woman's Coll.), Charlotte, North Carolina.
Damiano, Richard Ernest (Brooklyn Coll.), Brooklyn, New York.
Duttera, M. Julian, Jr. (Duke), West Point, Georgia.
Edwards, Sam Bingham, Jr. (U. of N.C.), Sanford, North Carolina.
Eisenberg, Carl Spencer (Ohio State U.), Euclid, Ohio.
Ellwanger, Frederick Robert, III (Duke), Pittsburgh, Pennsylvania.
Elmore, William Glenn (Texas Technological Coll.), Dallas, North Carolina.
Elsas, Frederick John (Harvard), Birmingham, Alabama.
Emslie, Robert Joseph (U. of Chicago), Elyria, Ohio.
Entman, Stephen Saul (Harvard Coll.), Jacksonville, Florida.
Fahy, Hugh Terrance (U. of Md.), Liverpool, New York.
Fee, William Homer, Jr. (Lafayette Coll.), Rockaway, New Jersey.
Flaherty, Lois Talbot (Wellesley), Staten Island, New York
Foscue, Henry Armfield, Jr. (U. of N.C.), High Point, North Carolina.
Freeman, Douglas Garland, Jr. (U. of N.C.), Gates, North Carolina.
Freeman, Elsie Joan (Smith), Valley Stream, New York.
Freeman, Jonathan (Harvard), Palo Alto, California.
Goldenberg, Robert Lewis (Columbia), No. Miami Beach, Florida.
Goodner, David Marshall (Duke), Puerto Rico.
Green, Richard Lee (Swarthmore), Pittsburgh, Pennsylvania.
Haberkern, Robert Paul (Rutgers), Highland Park, New Jersey.
Hall, James Hardman (Princeton), Danville, Virginia.
Harrison, Frank Late, Jr. (Duke), South Charleston, West Virginia.
Hart, John Martin Hicks (U. of N.C.), Durham, North Carolina.
Henley, Thomas Franklin (U. of N.C.), Chapel Hill, North Carolina.
Henry, David Patterson, II (U. of N.C.), Chapel Hill, North Carolina.
Hoffman, Philip Guthrie, Jr. (Rice), Houston, Texas.
Holberg, Doris Gayle (Rice), Houston, Texas.
Hopkins, Jay Everett (Duke), Durham, North Carolina.
Hutchinson, Forney, III (Harvard), Tulsa, Oklahoma.
Hyers, Thomas Morgan (Duke), Palatka, Florida.
Jackson, Gitta Wiessner (Lette-Haus), Berlin, Germany.
Johnson, Laurance Folkey (Carleton Coll.), Springfield, Illinois.
Jones, Dennis Eblen Darnell (U. of Tenn.), Knoxville, Tennessee.
Jones, Howard Wilbur, III (Amherst), Baltimore, Maryland.
Kern, Frank (U. of Pa.), Miami, Florida.
Klein, Gary Bruce (Pomona Coll.), Pasadena, California.
Kunstling, Ted Richard (Duke), Laguna Hills, Calif.
Kwart, Arnold Martin (U. of Fla.), Miami, Florida.
Lebbin, Dennis Roy (U. of Chicago), Chicago, Illinois.
Logan, William Sumner (Davidson), Lakeland, Florida.
Mandetta, Donald Frank (Colgate), Glen Rock, New Jersey.
Marcus, David L. (C.W. Post Coll.), Mineola, New York.
Miller, Richard Lawrence (Franklin & Marshall Coll.), Patchogue, New York.
Miller, Robert David (Davidson), Chapel Hill, North Carolina.
Moore, Terence Neal (The Citadel), Dundalk, Maryland.
Morton, Robert Edmund (U. of Rochester), Mamaroneck, New York.
Older, Robert Alan (Wesleyan), Teaneck, New Jersey.
Park, William Isaiah (Dartmouth), Springfield, Missouri.
Parker, Michael Dean (Fla. State U.), Madison, Indiana.
Plonk, James Wendell (Duke), Kings Mountain, North Carolina.
Porter, Roger John (Fla. Presb. Coll.), St. Petersburg, Florida.
Reisman, Terence Nat (Duke), Miami, Florida.
Sarver, Edward John (Northwestern), Fort Wayne, Indiana.
Seligson, David (Harvard), Brookline, Massachusetts.
Seningen, Ronald Perry (Duke), Wilmington, Delaware.
Sherwood, Geoffrey Kray (Brown), Middletown, Connecticut.

* Withdrew January 20, 1965.

Silvers, David Nathan (Haverford), Roslyn Heights, New York.
Simpson, Joe Leigh (Duke), McComb, Mississippi.
Snider, Joel Joseph (Columbia), Brooklyn, New York.
Sollek, Mark G. (U. of Cincinnati), Cincinnati, Ohio.
Stucky, Robert Christopher (Western Reserve U.), Glen Rock, New Jersey.
Taft, Charles Van (Duke), Greenville, North Carolina.
Taylor, Andrew Thompson, Jr. (Rice), Jackson, Tennessee.
Thurston, Thomas Gardiner, III (Davidson), Salisbury, North Carolina.
Trent, Rebecca Grey (Duke), Durham, North Carolina.
Wald, Harlan Ira (Duke), Scarsdale, New York.
Wexler, John Paul (Hobart Coll.), Brooklyn, New York.
Wheeler, William Felix, Jr. (U. of S.C.), Blackville, South Carolina.
Wohlgemuth, Stephen Alan (Drew), Long Valley, New Jersey.
Wynne, Marigail (U. of Rochester), Scarsdale, New York.

Class of 1967

Allen, David Geoffrey (Wesleyan), New York, N. Y.
Auburn, Robert Mark (Washington & Lee), Falls Church, Va.
Austin, Henry Vann (Davidson), Clinton, N. C.
Bath, Nicholas Middleton (Emory), Tampa, Fla.
Beshear, James Robert (U. of Ky.), Dawson Springs, Ky.
Blackburn, William W., II (Duke), Fort Meade, Md.
Boggess, Howard Preston (Yale), Fairmont, W. Va.
Broadbent, David N. (U. of Ill.), Champaign, Ill.
Brown, Gerald La Vonne (Johns Hopkins), Athens, Ga.
Brown, Walter A. (Hamilton Coll.), Tuckahoe, N. Y.
Buehler, John Henze (Oberlin), Durham, N. C.
Bunin, John Thomas (Rutgers), Kearny, N. J.
Burwell, William (U. of N.C.), Warrenton, N. C.
Butler, Stephen Allen (Davidson), Columbus, Ga.
Campbell, Barry Blair (Johns Hopkins), Millville, N. J.
Chervin, Paul Niesen (U. of Vt.), Worchester, Mass.
*Clark, James Ligon (Duke), Charlotte, N. C.
Crawford, Fred Allen, Jr. (Duke), Holly Hill, S. C.
Culver, Charles (Duke), Ringwood, N. J.
Danford, Jerry L. (Duke), Durham, N. C.
Dean, Arthur J., Jr. (U.S. Mil. Acad.), Laurinburg, N. C.
DeHart, Henry Sykes (V.P.I.), Blacksburg, Va.
Delse, Frederick Charles (M.I.T.), Cleveland, Ohio.
Dodson, William Edwin (Duke), Durham, N. C.
Farber, Mark (Columbia Coll.), Brooklyn, N. Y.
Flaherty, John T. (M.I.T.), Delmar, N. Y.
Futrell, J. William (Duke), Lynchburg, Va.
Gaines, Robert W. (U. of Cincinnati), New York, N. Y.
Gallis, Harry Anthony (Princeton), Athens, Ga.
Gerber, Carl Joseph (Washington U.), Durham, N. C.
Gianaras, George Mike (Duke), Tarpon Springs, Fla.
Giordano, Vincent B. (U. of Rochester), Endicott, N. Y.
Grode, David Lloyd (Duke), Hewlett, Long Island, N. Y.
Harper, Eugene Jutson (Duke), Knightdale, N. C.
Hinternhoff, Mary T. (Duke), Leakesville, N. C.
Hollister, David William (Oberlin), Bethesda, Md.
Huddleston, John F. (U. of Fla.), Jacksonville, Fla.
Jones, Janice Elizabeth (Wilson Coll.), Dover, N. J.
Jurgelsky, William (Rutgers), Kensington, Md.
Kendall, Malcolm Eugene (Duke), Durham, N. C.
Kesler, Richard William (Johns Hopkins), Lansing, Ill.
Kurtz, Robert Melvyn (Cornell), Rockville Centre, N. Y.
Levine, Michael Stuart (U. of Pa.), Macon, Ga.
Lynch, Charles T., Jr. (Duke), Beaufort, N. C.
Maniscalco, Benedict S. (U. of Fla.), Tampa, Fla.
Marshall, Robert N. (Davidson), Clemmons, N. C.
Matthews, Minor E. (Yale), Huntington, W. Va.
McLees, Byron D. (Johns Hopkins), Little Rock, Ark.
McMillan, Michael Reid (The Citadel), Conway, S. C.
Meriwether, Wilhelm D. (Mich. State), Charleston, S. C.
Miller, Robert F. (Haverford), Tallahassee, Fla.
Modirzadeh, Jamal (Duke), Tehran, Iran.
Otchin, Neil Stuart (U. of Fla.), Miami Beach, Fla.
Peery, Charles V., II (Davidson), Kinston, N. C.
Raynor, A. Clark (Wake Forest), Ormond Beach, Fla.
Riddick, Daniel Howison (Duke), Durham, N. C.
Robinson, Stephen C. (Emory), Griffin, Ga.
Rogol, Alan David (M.I.T.), Seymour, Conn.
Rosati, Robert A. (Yale), Durham, N. C.
Saltz, James E., Jr. (Duke), St. Petersburg, Fla.
Samuels, Jesse David (Columbia), Flushing, N. Y.
Saunders, Wade H., III (Hampden-Sydney Coll.), Roanoke, Va.

* Deceased, January 5, 1965.

Scarborough, W. A., Jr. (Duke), Wendell, N. C.
Scherer, James L. (Kenyon), Niles, Ohio.
Schneider, Henry C., Jr. (Williams), Meadowbrook, Pa.
Segal, Herbert Erwin (Rutgers), Newark, N. J.
Smith, Sandra Mildred (U. of Miss.), Texarkana, Ark.
Speropoulos, Athan John (Johns Hopkins), Miami, Florida.
Stowell, R. Jeremy Averill (Northwestern), Broken Arrow, Okla.
Stubbs, Allston J., Jr. (Duke), Durham, N. C.
Thrash, Melvin Lawrence (Duke), Asheville, N. C.
Trout, Hugh Henry, III (Washington & Lee), Roanoke, Va.
Twele, Thomas (Columbia Coll.), Syosset, N. Y.
Underwood, Lee C., III (Oberlin), Canton, Ohio.
Vollmer, Robin T. (Duke), Louisville, Ky.
Weston, Leona Bell (Duke), Garner, N. C.
Wetterau, Norman W. (Wheaton), Akron, Ohio.
Wilfong, Robert F. (U. of N.C.), Carrboro, N. C.
Williams, Donald Jarvis (U. of Hawaii), Honolulu, Hawaii.
Willson, Leroy M., Jr. (U. of N.C.), Oxford, Ga.
Willwerth, Ben Matthews (Duke), Montour Falls, N. Y.
Woodard, William T., Jr. (Duke), Coral Gables, Fla.

Class of 1966

Adler, Charles S. (Cornell), Flushing, N. Y.
Alexander, James Allen (Davidson), Gastonia, N. C.
Allen, Barna T., Jr. (Duke), Leakesville, N. C.
Allen, James Kenneth (U. of S. C.), Florence, S. C.
Appen, Richard E. (Duke), Nashville, Tenn.
*Ballentine, Rudolph M., Jr. (Duke), Ballentine, S. C.
Bechtel, Richard C., Jr. (Swarthmore), Doylestown, Pa.
Berry, Peter Evans (Yale), Atlanta, Ga.
Bland, Wiley R. (N.C. State), Edward, N.C.
Borden, Ernest C. (Harvard), Fayetteville, Ark.
Bradford, John W. (Washington & Lee), Charleston, W. Va.
Brian, Earl W., Jr. (Duke), Raleigh, N. C.
Brown, Robert G. (U. of Va.), Norfolk, Va.
Burk, Peter G. (Duke), Minneapolis, Minn.
Carr, William Alexander (Princeton), Charlotte, N. C.
Clark, Joe L. (Emory), Delray Beach, Fla.
Clarke, Linda Ruth (U. of Tenn.), Knoxville, Tenn.
Cooper, Edwin B., Jr. (Duke), Arlington, Va.
Crook, John N. (Howard), Opelika, Ala.
Currie, Donald P. (Davidson), Charlotte, N. C.
Daniel, Eubert J. (Valparaiso), New Britain, Conn.
Davis, Walter Etchells (Bowdoin), Easley, S. C.
Dick, William B. (Washington & Lee), Morristown, Tenn.
Dillingham, William S. (Harvard), Lancaster, S. C.
Donovan, Lawrence T. (U. of N.C.), Chapel Hill, N. C.
Ferris, Barry (Duke), Haifa, Israel
Fisher, Robert B. (Centre Coll.), Bay Shore, N. Y.
Ford, Raymond F. (Pa. State), Chatham, N. J.
Fox, William W. (Duke), Ruxton, Md.
Graham, Doyle Gene (Texas A. & M.), Knox City, Texas.
Grant, John Andrew, Jr. (Harvard), Tallahassee, Fla.
Greene, John Elbert (Duke), Tallahassee, Fla.
Grehl, Todd M. (Duke), Ft. Lauderdale, Fla.
Halikas, James (Brooklyn), Brooklyn, N. Y.
Hammett, Elliott B. (Yale), Spartanburg, S. C.
Hayter, George M. (Stanford), Long Beach, Calif.
Herron, Charles B. (Memphis State), McKenzie, Tenn.
Hitch, David C. (U. of N.C.), Raleigh, N. C.
Hopkins, Christie Benet (U. of the South), Columbia, S. C.
Hudson, Terry M. (Duke), Charleston, W. Va.
Johnson, James R. (Duke), Tulsa, Okla.
Katz, Sheila (U. of Chicago Med. School), Durham, N. C.
Kline, George L. (U. of Tenn.), Robbins, Tenn.
Kohler, Stewart E. (U. of Va.), Blacksburg, Va.
Lewis, Alvin M. (U. of Fla.), Durham, N. C.
Lohrbauer, Leif A. (Yale), Clearwater, Fla.
Martin, Mitz McDowell (U. of Va.), Halifax, Va.
McCully, James Greig (U. of Fla.), Jacksonville, Fla.
McGregor, Douglas (Duke), Pelham, N. Y.
McNeill, Emma Roberta (Duke), Columbia, S. C.
Mignone, Robert J. (Amherst), New Haven, Conn.
Moorman, Claude II (Duke), Miami, Fla.
Morriss, Frank H., Jr. (U. of Va.), Birmingham, Ala.
Nash, James L. (Duke), Durham, N. C.
Newmark, Emanuel (U. of Amsterdam), Newark, N. J.
Niemeyer, Charles J. (Washington & Lee), Silver Spring, Md.
Norton, Charles B., Jr. (Duke), Jacksonville, Fla.
Nuckolls, James Garland (Davidson), Galax, Va.
Obenour, William H., Jr. (U. of Tenn.), Knoxville, Tenn.
Osteen, Robert Tilden (Dartmouth), Savannah, Ga.
Palmer, Earl Alfred (Ohio State), Washington C.H., Ohio
Perriello, Vito A., Jr. (U. of Va.), Dunbar, W. Va.
Pierson, Willard C., Jr. (Duke), Raleigh, N. C.

* Leave of absence, Nov. 10, 1964.

Price, William D. (Oberlin), Bethesda, Md.
Ray, Karl (U. of N.C.), Greensboro, N. C.
Redding, Marshall (Duke), Asheville, N. C.
Rich, John M. (Duke), Covington), Ky.
Robertson, James D. (Duke), Weirton, W. Va.
Rozear, Marvin P. (Davidson), Jacksonville, Fla.
Scott, George Stuart (Duke), Augusta, Ga.
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Wellington, Catherine Ann (Dickinson), Panama City, Republic of Panama
Zirkle, Lewis G., Jr. (Davidson), Blacksburg, Va.

Class of 1965

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Hoyle, Thomas C., III (Duke), Greensboro, N. C.
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Kay, Earl D. (Duke), Anderson, S. C.
Krueger, Ronald R. (Duke), Short Hills, N. J.
Kulvin, Stephen M. (Duke), Miami, Fla.
LeBauer, Eugene S. (Duke), Greensboro, N. C.
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Berne, Freeman Albert (Columbia, S. C.), Charlotte Memorial Hosp., Charlotte, N. C.
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Friedel, Robert Oliver (Durham, N. C.), Duke Hosp., Durham, N. C.
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BULLETIN
OF
DUKE UNIVERSITY

The Divinity School

ANNOUNCEMENTS FOR 1965-66

VOLUME 37 MAY, 1965 NUMBER 7-A

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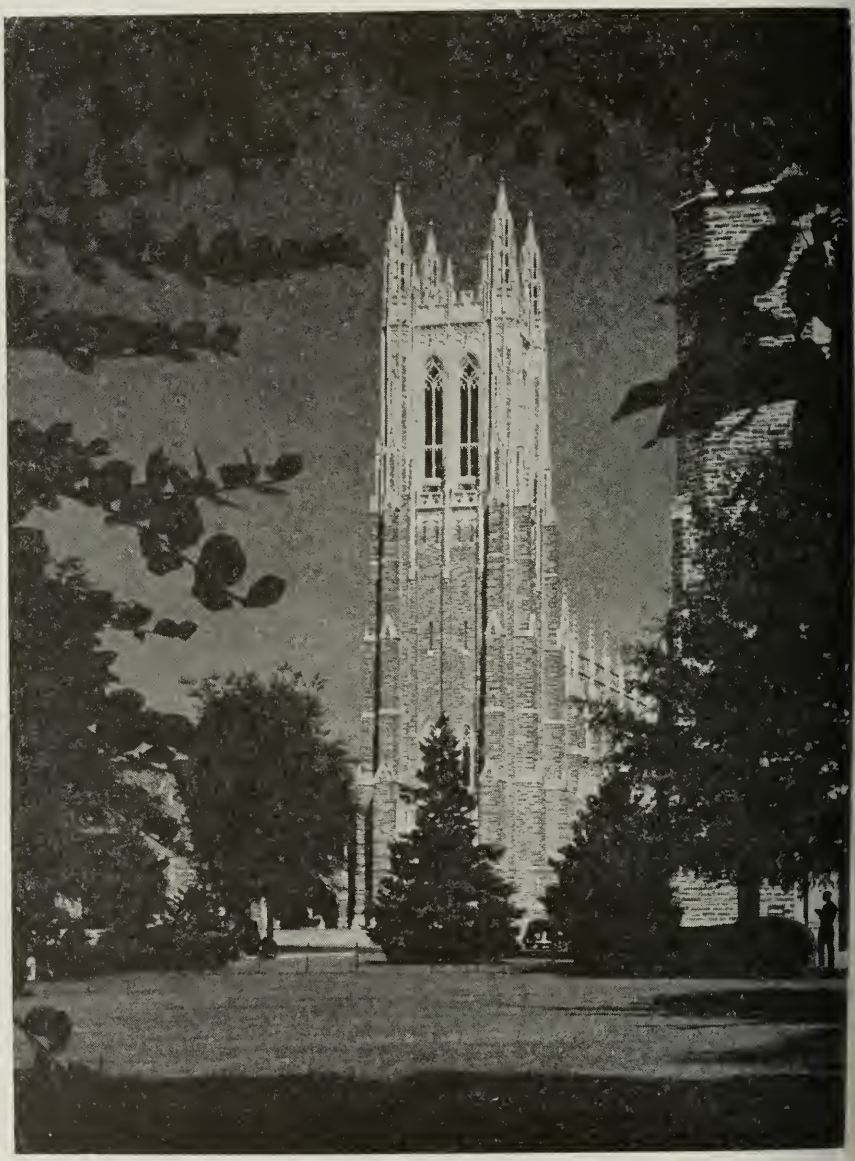
BULLETIN
OF
DUKE UNIVERSITY



THE DIVINITY SCHOOL

1964-65
ANNOUNCEMENTS FOR 1965-66

DURHAM, NORTH CAROLINA
1965



The Chapel

Contents

Calendar 5
Officers of Administration 7
Emeriti 7
Educational Administration 8
The Library 8
Faculty 9
Divinity School Committees 11

General Information

Historical Statement 12
The Purpose of the Divinity School 12
Courses of Study Offered by the Divinity School 13
Courses of Study in Religion Offered by the Graduate School of Arts and Sciences 14
Library Resources 14
Corporate Worship 16
Public Lectures 16

Program of Continuing Education

Divinity School Seminars 18
The Clinic in Preaching 18
The Clinic in Pastoral Care 19
The Rural Church Clinic 19
The School for Supply Pastors 19
Facilities for Advanced Study in the American Schools of Oriental Research 19

Student Life

Divinity School Choir 21
The Coordinating Council for Community Life 21
Divinity Dames 21
Student Publications 22

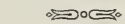
ADMISSION AND REQUIREMENTS FOR DEGREES

Requirements for Admission 23
Pre-Seminary Curriculum 24
Transfer of Credit 25
Advanced Standing 25
Admission on Probation 26
Ministerial and Professional Qualifications 26
Faculty Advisers 27
Requirements for the Degree of Bachelor of Divinity 28
Distribution by Semesters of Required Courses 30
Schedule of Required Courses 31
Vocational Groups 33
Senior Vocational Qualifying Finals 35
Administering the Curriculum 36
Requirements for the Degree of Master of Religious Education ... 39
Requirements for the Degree of Master of Theology 41
Courses of Instruction 43

STUDENT EXPENSES AND RESIDENTIAL ARRANGEMENTS

Fees and Cost 55
Student Health 56
Living Accommodations 56
Motor Vehicles 58
Financial Aid 59
Field Education 64
Scholarship Resources 66
The Summer Session of the Divinity School 71
Enrollment 1964-65 72

Calendar



1965

September 16, Thursday	Dormitories open for occupancy.
September 17, Friday	Junior Orientation begins.
September 20, Monday	4:00 P.M.—Faculty meeting. 7:30 P.M.—Dean's reception for new students.
September 21, Tuesday	9:00 A.M.- 1:00 P.M.—Registration of returning students. 9:00 A.M.- 1:00 P.M.—Photographing of new students. 9:30 A.M.-10:30 A.M.—Library tours for new students. 2:00 P.M.- 5:00 P.M.—Registration of new students.
September 22, Wednesday	9:00 A.M.- 1:00 P.M.—Completion of registration. 9:00 A.M.-11:00 A.M.—Library tours for new students. 11:00 A.M.-12:00 M.—Physical examination for new women students. East Campus Infirmary. 2:00 P.M.- 5:00 P.M.—Placement tests for all new students. 125 Engineering Building. 6:00 P.M.- 7:00 P.M.—Physical examinations for new men students. Out-Patient Clinic, Duke Hospital.
September 23, Thursday	8:10 A.M.—Fall semester classes begin.
September 24, Friday	10:10 A.M.—Opening Convocation.
September 29, Wednesday	11:00 A.M.—Dean's Convocation of Junior class. Last day for changing courses for the fall semester.
November 1-3, Monday-Wednesday	The Christian Convocation and Gray Lectures.
November 6-8, Friday-Sun.	Conference on Ministry.
November 10, Wednesday	11:00 A.M.—Dean's Convocation of Student Body.
November 24, Wednesday	5:30 P.M.—Thanksgiving recess begins.
November 29, Monday	12:00 M.—Classes resume.
December 11, Saturday	Founders' Day.
December 17, Friday	5:30 P.M.—Christmas recess begins.

1966

January 3, Monday	12:00 M.—Classes resume.
January 12-13, Wednesday-Thursday	Registration of resident students for the spring semester.
January 14, Friday	5:30 P.M.—Fall semester classes end.
January 18, Tuesday	2:00 P.M.—Final examinations begin.
January 28, Friday	5:00 P.M.—Final examinations end.
February 1, Tuesday	Registration of new students.
February 3, Thursday	8:10 A.M.—Spring semester classes begin.
February 9, Wednesday	Last day for changing courses.
March 25, Friday	5:30 P.M.—Spring recess begins.
April 4, Monday	12:00 M.—Classes resume.
April 18-28	Pre-registration for Fall Semester.
May 4, Wednesday	11 A.M.—Dean's address to Senior class.
May 18, Wednesday	11:00 A.M.—Closing Convocation.
May 19, Thursday	5:30 P.M.—Spring semester classes end.

May 23, Monday	2:00 P.M.—Final examinations begin.
June 1, Wednesday	5:00 P.M.—Final examinations end.
June 3, Friday	10:30 A.M.—Faculty meeting. 12:30 P.M.—Faculty luncheon.
June 4, Saturday	Commencement begins.
June 5, Sunday	11:00 A.M.—University Baccalaureate service. 7:45 P.M.—Divinity School Baccalaureate service.
June 6, Monday	Commencement—conferral of degrees.

Officers of Administration

Douglas Maitland Knight, Ph.D., LL.D., Litt.D.
President of the University

Robert Taylor Cole, Ph.D.
Provost

Gerhard Chester Henricksen, M.A., C.P.A.
Vice President for Business and Finance
Treasurer

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Vice President for Planning and
Institutional Studies and Assistant Provost

Frank Leon Ashmore, A.B.
Vice President for Institutional Advancement and
Assistant Provost

Charles Edward Jordan, A.B., LL.D.
Vice President for University Relations

Frank Traver de Vyver, Ph.D.
Vice Provost

Harold Walter Lewis, Ph.D.
Dean of Arts and Sciences and Vice Provost

Barnes Woodhall, M.D.
Vice Provost

Benjamin Edward Powell, Ph.D.
Librarian

Richard Lovejoy Tuthill, Ed.D.
University Registrar

Craufurd David Goodwin, Ph.D.
Secretary

Edwin Constant Bryson, LL.B.
University Counsel

Emeriti

Franklin Simpson Hickman (1927), A.M., S.T.B., Ph.D., D.D.
Professor Emeritus of Psychology of Religion

Hiram Earl Myers (1926), S.T.M., D.D.
Professor Emeritus of Biblical Literature

H. Shelton Smith (1931), Ph.D., D.D., Litt.D.
James B. Duke Professor Emeritus of American Religious Thought

Hersey Everett Spence (1918), A.M., B.D., D.D., Litt.D.
Professor Emeritus of Religious Education

Arley John Walton (1948), B.S.L., D.D.
Professor Emeritus of Church Administration and Director of Field Work

Educational Aaministration

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Dean of the Divinity School

Osmond Kelly Ingram (1959), B.D.
Dean of Students

Donald J. Welch (1965), B.D.
Assistant to the Dean

Fletcher Nelson (1964), B.D.
Assistant to the Dean for Development

Helen Mildred Kendall (1950), A.B.
Administrative Assistant and Registrar

William Arthur Kale (1952) B.D., D.D.
Director of Field Education

Daniel M. Schores, Jr. (1965), B.D.
Associate Director of Field Education

M. Wilson Nesbitt (1958), B.D., D.D.
Director of the Work of the Rural Church under the Duke Endowment

Mattie Belle Powell (1959)
Administrative Assistant for the Work of the Rural Church and and Student Financial Aid

DIVISION OF ADVANCED STUDIES

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Richard A. Goodling (1959), B.D., Ph.D.
Director of Instruction in Pastoral Care

William Arthur Kale (1952), B.D., D.D.
Director of the Master of Religious Education Program

THE LIBRARY

Donn Michael Farris (1950), B.D., M.S. in L.S.
Librarian

Harriet V. Leonard (1960), B.D., M.S., in L.S.
Reference Librarian

Patricia Reynolds, B.A.
Circulation Librarian

Ottalee Winegar, B.A.
Assistant Circulation Librarian

SECRETARIAL STAFF

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Kay Rundell
Secretary to the Registrar

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Secretary to the Director of Graduate Studies in Religion

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Secretary to the Dean of Students

Iris Zimmerman
Secretary to the Assistant to the Dean

Linda Jones, A.B.
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Linda S. Chandler
Secretary for the Rural Church

Mary Chestnut
Vivian Crumpler
Faculty Secretaries

Faculty

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Assistant Professor of Pastoral Care and Chaplain Supervisor

Hugh Anderson (1957), M.A., B.D., Ph.D.
Professor of Biblical Criticism and Theology

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Associate Professor of English Church History

Waldo Beach (1946), B.D., Ph.D.
Professor of Christian Ethics

Kenneth Willis Clark (1931), B.D., Ph.D.
Professor of New Testament

Robert B. Claytor (1963), B.D., Th.M.
Instructor in Pastoral Care and Chaplain Supervisor

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Robert E. Cushman (1945), B.D., Ph.D.
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James Michael Efird (1962), B.D., Ph.D.
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Richard A. Goodling (1959), B.D., Ph.D.
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Egil Grislis (1959), B.D., Ph.D.*
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† On sabbatical leave, Spring Semester, 1965-66.
‡ On sabbatical leave, Fall Semester, 1965-66.

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Dwight Moody Smith, Jr. (1965), B.D., Ph.D.
Associate Professor of New Testament

Harmon L. Smith (1962) B.D., Ph.D.
Assistant Professor of Christian Ethics

William Franklin Stinespring (1936), M.A., Ph.D.
Professor of Old Testament and Semitics

John Strugnell (1960) M.A. (Oxon.)
Assistant Professor of Old Testament

Harry B. Partin (1964), B.D., Ph.D.
Lecturer in History of Religions

Herbert P. Sullivan (1960), B.D., Ph.D.
Lecturer in History of Religions

Orval Wintermute (1959), B.D., Ph.D.
Lecturer in Old Testament

Owen L. Norment (1965), B.D.
Visiting Assistant Professor of American Christianity

Allen Freeman Page, B.D.
Teaching Assistant in Greek

Charles L. Rice, B.D.
Assistant in Preaching

Fred W. Reid, Jr. (1965), B.D., Th.M.
Chaplain Supervisor and Lecturer in Pastoral Care

William C. Spong (1965), B.D., Th.M.
Chaplain Supervisor and Lecturer in Pastoral Care

William R. Steininger (1965), (1960), B.D., S.T.M.
Chaplain Supervisor and Lecturer in Pastoral Care

Divinity School Committees

ADMINISTRATIVE

Policy and Appointments: Cushman, *ex officio,* Anderson, Beach, Cleland, Kale, Petry, Richey, Stinespring.

Endowment and Field Education: Kale, Goodling, Hall, Ingram, Nesbitt, Schores.

Registration and Advanced Standing: Stinespring, Efird, Ingram, Kendall, *ex officio.*

Scholarships and Financial Aid: Cushman, *ex officio,* Ingram, Kale, Nesbitt, Richey, Schores, Powell, *ex officio.*

Ministerial and Professional Qualifications: Ingram, *ex officio,* Aitken, Goodling, Herzog, Hall, Kale, Schores.

ACADEMIC AFFAIRS

Academic Standing: Cushman, *ex officio,* Efird, Farris, Ingram, Hall, Hillerbrand, Kale, Stinespring, Schores, Kendall, *ex officio.*

Admissions: Cushman, *ex officio,* Efird, Goodling, Ingram, Kale, Lacy, Robinson, Schores, Kendall, *ex officio.*

Curriculum: Cushman, *ex officio,* Anderson, Herzog, Hillerbrand, Lacy, Petry, Poteat, H Smith, M. Smith.

Library Resources: Farris, Baker, Hillerbrand, Robinson, Stinespring, Strugnell.

Master of Theology: Richey, *ex officio,* Goodling, Hillerbrand, Robinson, M. Smith, Strugnell.

Master of Religious Education: Kale, *ex officio,* Hall, Richey, Schores.

JOINT AND SPECIAL COMMITTEES

Alumni Affairs: Welch, Ingram, Kale, H. Smith.

Chapel Worship and Christian Life: Hall, Hanks, M. Smith, Robinson, Rudin

Christian Responsibility and Cultural Trends: Herzog, Lacy, Poteat, Richey, H. Smith.

Community and Social Events: Ingram, Baker, Clark, Claytor, Cleland, Goodling, Grislis, Hall, Rudin, Stinespring, Welch.

Convocation: Richey, *ex officio,* Cleland, Hanks, Welch.

Divinity School Review: Lacy, Baker, Efird, Farris, Grislis, Robinson, Strugnell.

Lectures and Public Events: Cleland, Clark, Henry, Lacy, Poteat, Richey, Rudin, M. Smith, Welch.

James A. Gray Lectures: Cleland.
Divinity School Seminars: Clark, Richey, Poteat, M. Smith.
Assembly Program: Welch.
Missions Symposium: Lacy.

School of Approved Supply Pastors: Kale, Henry, Ingram, Rudin, Welch.

St. Michael's (Dumfries) Associates: Cleland, Anderson, Ingram, Hall, Schores.

A quorum shall be sufficient to transact business of committees, or two-thirds present and voting.

General Information

HISTORICAL STATEMENT

THE indenture of Trust signed on December 11, 1924, by Mr. James B. Duke, which established Duke University, mentioned first among its objects the training of ministers of the Gospel. The Divinity School was, accordingly, the first of the graduate professional schools to be organized. Its work began with the year 1926-1927, the formal opening exercises being held on November 9, 1926.

The Reverend Doctor Edmund Davison Soper was the first Dean of the Divinity School. He resigned in 1928 to become President of Ohio Wesleyan University, and was succeeded by the Reverend Doctor Elbert Russell, and the latter in turn in 1941 by the Reverend Doctor Paul Neff Garber. In 1944, Dean Garber was elected to the episcopacy of the Methodist Church, and Doctor Harvie Branscomb assumed the duties of the Dean's office. In 1946, Dean Branscomb became Chancellor of Vanderbilt University, and in 1947 the Reverend Doctor Paul E. Root was elected Dean but died before he could assume the office. The Reverend Doctor Harold A. Bosley became Dean in 1947 and resigned in 1950 to become the pastor of the First Methodist Church, Evanston, Ill. The Reverend Doctor James Cannon was appointed Dean of the Divinity School March 1, 1951. After a period marked by important administrative integration of the School, Doctor Cannon resigned the duties of deanship, September 30, 1958. The Reverend Professor Robert Earl Cushman was elected Dean and assumed the responsibilities of the office October 1, 1958.

THE PURPOSE OF THE DIVINITY SCHOOL

The primary purpose of the Divinity School is to provide training for properly qualified persons planning to enter the Christian ministry. This includes not only prospective ministers in local churches, but also those preparing themselves to be missionaries at home and abroad, ministers of Christian Education, teachers of religion, and chaplains. Vital to all of these forms of service is a full understanding of the beginnings, content, and history of the Christian faith and its special pertinence for the spiritual needs of the modern world. Studies of a broad and thorough character directed toward such an understanding constitute the center of the curriculum of the Divinity School and are regarded as the basic training for all prospective Christian ministers. Specific instruction in the skills required of local ministers

and of leaders in the work of Christian Education is also provided. As funds become available for the purpose and as needs appear, additional training in specialized skills and areas of knowledge will be added to the curriculum.

Bound by ties of history and obligation to The Methodist Church, the Divinity School is ecumenical in its interests and outlook. Its faculty is limited to no one denomination, but draws upon the resources of them all. Students of the several denominations are admitted on an equal basis. The Divinity School conceives its task to be one of broad service to the Church in all of its forms.

THE RELATION OF THE DIVINITY SCHOOL TO DUKE UNIVERSITY

The Divinity School is an integral part of the University and shares fully in its activities, privileges, and responsibilities. The Sunday services in the University Chapel give Divinity School students an opportunity to hear each year a number of leading ministers of the country. The University Libraries make easily accessible a rich collection of 1,700,000 volumes. Selected courses in the Graduate School of Arts and Sciences and in the professional schools are open to Divinity School students without payment of additional fees. The general cultural and recreational resources of the University are available to them on the same basis as to other students.

COURSES OF STUDY OFFERED BY THE DIVINITY SCHOOL

The Divinity School offers three courses of study. The basic course is that which leads to the degree of Bachelor of Divinity. This is a three-year course and is recommended to all those preparing themselves for the work of the parish ministry. Students who hold pastoral charges, or other remunerative work requiring any substantial time apart from their studies, may carry only reduced schedules of work, and, in most cases, unless work is taken in the Duke University Summer Session, will spend four years in completion of the requirements for the B.D. degree.

The Divinity School offers study leading to the degree of Master of Religious Education. This course is designed for persons who wish to take specialized positions in the work of Christian Education. The course does not provide a general preparation for the work of the regular ministry and cannot serve as a substitute for it. No exchange of credits between the two courses is permitted, nor can departmental courses taken be credited toward more than one degree.

A new program of study leading to the degree of Master of Theology (Th.M.) was instituted in the academic year 1960-1961. This course is planned to afford a limited number of superior students an

opportunity for intensive theological study beyond the B.D. degree. It is a terminal professional degree, ordinarily to be completed in a year, and not to be regarded as leading toward a doctorate.

The requirements for each of these degrees are stated on page 28 through 42 of this catalogue.

COURSES OF STUDY IN RELIGION OFFERED BY THE GRADUATE SCHOOL OF ARTS AND SCIENCES

Students who desire to pursue studies in religion leading to the degrees of Master of Arts or Doctor of Philosophy in Religion should register in the Graduate School of Arts and Sciences. Study and research may be pursued in three fields: (1) Biblical Studies; (2) Historical Studies, and (3) Systematic and Contemporary Studies. A list of courses approved by the Graduate Faculty for work in these fields, together with general requirements for admission to the Graduate School, may be found in the *Bulletin of the Graduate School.* This Bulletin is available on application to the Dean of the Graduate School of Arts and Sciences, Duke University.

Graduate students in religion are eligible for financial support under a regular University Fellowship, a Gurney Harriss Kearns Fellowship in Religion, administered by the Graduate School, or for one of the National Foundation fellowships such as Rockefeller, Woodrow Wilson or Danforth. Applications for fellowships administered by Duke University should be submitted to the Dean of the Graduate School by February 15.

Inquiries concerning specific requirements of the Program of Religion in the Graduate School should be addressed to Professor Waldo Beach, Director of Graduate Studies in Religion.

LIBRARY RESOURCES

The Divinity School Library, containing a collection of more than 120,000 volumes in the field of religion and closely related disciplines, affords an unusual wealth of material for the seminary student. Although it is an integral part of the University's nine-unit library system which possesses more than 1,700,000 books, the Divinity School Library has its own separate facilities in the Divinity School building. Its book collection is operated on the open stack system; and its reading room provides study facilities for students and housing space for the special reference collection in religion and for the current numbers of the more than 400 religious periodicals to which the Library subscribes.

Staffed by a Librarian and a Reference Librarian who are trained in theology as well as in library administration, and by a Circulation Staff of two persons aided by a number of student assistants, the

Divinity School Library offers a variety of reference services to assist the student in selecting and locating materials. The staff, in cooperation with the faculty, maintains a book and periodical collection to support both basic courses and advanced research in all major fields of religious studies.

The Divinity School Library is adjacent to the General Library and is internally connected with it by a corridor which gives easy access to its many departments. The seminary student is permitted to withdraw books from the collection of more than 1,000,000 volumes in the General Library, and to make use of its other resources and facilities which include manuscripts, archives, public documents, newspapers, periodicals, microfilm, maps, rare materials (among which are thirty prized ancient Greek manuscripts), reference assistance, and provision for the borrowing of books not in the Duke Libraries from the Library of the University of North Carolina and other institutions.

THE HENRY HARRISON JORDAN LOAN LIBRARY

Henry Harrison Jordan, distinguished member of the Western North Carolina Conference (1862-1931) was memorialized by his children in the establishment of an endowment in 1947. The Divinity School Librarian is the custodian of books purchased under this fund for loan, through postal services, to qualified ministers of all demominations or localities. The Jordan Loan Library undertakes to maintain a catalogue of up-to-date publications representative of the several theological disciplines and areas of the minister's professional interest. Books are loaned on application to the Librarian of the Divinity School from a printed catalogue supplied on request.

ORMOND MEMORIAL FUND

Established 1924 by Dr. J. M. Ormond, '02, and Mrs. Ormond, in memory of his mother and father, Mr. and Mrs. J. J. Ormond, the income to be used for the purchase of a collection of books on the rural church for the Library of the Divinity School at Duke University.

AVERA BIBLE FUND

Established 1895 by gift of Mrs. L. B. McCullers in memory of her husband, Willis H. Avera. The fund provides for the purchase of books to be used for the Divinity School Library.

LOUIS W. BAILEY MEMORIAL FUND

This memorial fund was established in 1958 by the Reverend A. Purnell Bailey in memory of his father. The income is to be used for books for the Divinity School Library.

THE WILLIAM ARTHUR KALE, JR., MEMORIAL FUND

William Arthur Kale, Jr. was a member of the Duke University class of 1958, a lover of sacred art and music, and a member of the University Chapel Choir. In his memory there was established in 1964, by the provision of his parents, Professor and Mrs. William Arthur Kale, Sr., a fund for the purchase of books and other materials in the area of fine arts and religious musicology for the perpetual enrichment of the holdings of the Divinity School Library.

CORPORATE WORSHIP

One of the most important aspects of a program of training for Christian service is warm and discriminating common prayer. The center of the corporate life of the Divinity School is its own place of worship, York Chapel. Regular chapel services are held, at which all students are expected to be present. Services are led by members of the faculty, by visiting ministers, and by members of the student body. Prayer groups are held in the dormitories weekly and special groups during the Lenten Season.

PUBLIC LECTURES

The Committee on Lectures and Public Events presented the following lecturers (with their topics) during the year 1964-65: The Reverend Dr. Eric Baker, Secretary of the Methodist Conference in Great Britain ("The Anglican-Methodist Discussion on Possible Union"); Dr. M. Jack Suggs, Professor of New Testament at Brite College of the Bible, Texas Christian University ("Wisdom Christology in the Gospel of Matthew"); Dr. Barnes Woodhall, Vice Provost in Charge of Medical Affairs, Duke University ("The Doctor's Dilemma"). The fourth Faculty Lecture was delivered by Professor Ray Petry ("The Critical Temper and the Practice of Tradition"). In addition, special lectures were presented by the Christian Missions Symposium and by the Student Fine Arts Committee.

THE JAMES A. GRAY LECTURESHIP

The James A. Gray Lectures were established in 1950 as part of the fund set up in 1947 by Mr. James A. Gray of Winston-Salem, North Carolina. This lectureship was once again delivered in connection with the Ministers' Convocation, held at the University in the Fall. The lecturers were Father Godfrey Diekmann, O.S.B., of St. John's Abbey, Minnesota and Dr. Robert E. Cushman, Dean of the Duke Divinity School. Their joint subject was "The Second Vatican Council." The four lectures were published in a special edition of the *Divinity School Review* in the Spring of 1965.

THE DIVINITY SCHOOL LIBRARY LECTURESHIP

In 1948 the Duke Divinity School Library Lectures were established by the Reverend George Brinkmann Ehlhardt for the purpose of bringing to the Divinity School a succession of religious leaders. The lecturer for 1964-65 was the Reverend Doctor Krister Stendahl, Professor of Biblical Studies at Harvard University. His subject was "A Detheologized Paul."

SYMPOSIUM OF CHRISTIAN MISSIONS

Each year, in collaboration with the Methodist Board of Missions, the Divinity School presents a team of distinguished participants in the world mission of the Church, usually including a secretary of missionary personnel and a Duke alumnus serving overseas. The general aims are "to inform students and faculty of the philosophy and work of missions as seen through the personal experience of speakers; to educate present and future ministers so that they will have a vital concern for the promotion of missionary education in the local church; and to evaluate the missionary enterprise as a significant force in the revolutionary world." The featured speaker in 1965 was Dr. J. Russell Chandran, Principal of United Theological College, Bangalore, India; the alumnus was the Rev. David L. Swain, '51, of Japan.

Program of Continuing Education

DIVINITY SCHOOL SEMINARS

THE Divinity School, with the support of the James A. Gray Fund, conducts each year a series of extension Seminars consisting of two-day study courses for Divinity School alumni and other ministers. In 1964-65 three Seminars were held as follows: Columbia, S. C., in Washington Street Methodist Church (November 9-10, 1964); Greensboro, N. C., in West Market Street Methodist Church (January 18-19, 1965); and Fayetteville, N. C., in Hay Street Methodist Church (January 21-22, 1965). The subject presented in all three Seminars was "Current Interpretation of the New Testament."

Lecturers were Dr. Hugh Anderson, Professor of Biblical Criticism and Theology in the Divinity School of Duke University; Dr. Howard Clark Kee, Professor of New Testament in the Theological School of Drew University; and Dr. Krister Stendahl, the Frothingham Professor of Biblical Studies in the Divinity School of Harvard University.

Projected for 1965-66 are Seminars in Columbia, S. C., at Main Street Methodist Church (November 15-16, 1965); Gastonia, N. C., at First Methodist Church (January 17-18, 1966); and Goldsboro, N. C., at St. Paul Methodist Church (January 19-20, 1966). The subject in all three Seminars will be "Moral Responsibility and the Christian."

The lecturers in 1965-66 will be Dr. Hans Frei of the Department of Religion in Yale University; Dr. William H. Poteat, Associate Professor of Christianity and Culture in the Divinity School of Duke University; and Dr. Donald Shriver of North Carolina State College of the University of North Carolina, Director of the "Experimental Study of Religion and Society."

THE CLINIC IN PREACHING

The Eighth Annual Clinic in Preaching will be in session in the summer of 1965, between July 19th and 30th. Seminary graduates who have served in active ministry for 5 years or more are invited. The clinic will concern itself mainly with principles of sermon construction and delivery, giving ample opportunity for each member to preach for critique. Matters of theological and practical import for preachers will be discussed in informal sessions. The clinic is directed by Professor Thor Hall, assisted by other members of the preaching department faculty. No academic credit is given.

THE CLINIC IN PASTORAL CARE

The Clinic in Pastoral Care is offered under the direction of Professors Richard A. Goodling and Robert E. Smith and assisted by the Chaplains in the Medical Center and will be held July 19-July 30, 1965. Through lectures, group discussions, and hospital visitation experiences, explorations are made of the meaning of selfhood, the self in crisis, and the ministry to those caught in the crisis of illness. Registration is limited to twenty ministers of any denomination who hold the B.D. degree. No academic credit will be given.

THE RURAL CHURCH CLINIC

The Rural Church Clinic, to be held July 19-July 30, will consist of intensive training, study, and planning in the area of the church's responsibilities in the town and country community, giving particular emphasis to the development of an indigenous leadership. For registration information write to Professor M. Wilson Nesbitt, Director.

THE SCHOOL FOR SUPPLY PASTORS

In cooperation with the Department of In-Service Training of the Board of Education and the Southeastern Jurisdictional Conference of The Methodist Church, Professor W. A. Kale directs for the Divinity School a School for Supply Pastors of The Methodist Church and others taking the Methodist course of study for ministers. This school is in session for approximately four weeks each summer, and the required studies for one full year can be completed in this period. This is not a part of the regular work of the Divinity School and no credit toward a seminary degree can be earned. The faculty includes representatives from the Divinity School and other church-related institutions plus selected leaders of nearby Annual Conferences. The seventeenth session of the Supply Pastors' School is scheduled for July 12-August 6, 1965.

FACILITIES FOR ADVANCED STUDY IN THE AMERICAN SCHOOLS OF ORIENTAL RESEARCH

The Divinity School of Duke University is one of the supporting members of the American Schools of Oriental Research. Accordingly, students in the Divinity School have the privilege of attending the American School in Jerusalem or the one in Bagdad without charge for tuition. They may also compete for the financial aids which are offered annually by the Schools. These consist of four fellowships, the stipends depending upon available funds.

PROGRAMS IN PASTORAL CARE

Programs in Pastoral Care beyond the studies incorporated in the B.D. curriculum are provided in cooperation with the Duke Univer-

sity Medical Center, North Carolina Memorial Hospital in Chapel Hill, and Dorothea Dix Hospital in Raleigh. The staff for these programs consists of faculty members in Pastoral Care of the Divinity School and the Chaplains of the cooperating hospitals.
Five such special programs are available:

1. A quarter of Clinical Pastoral Training is available to a limited number of B.D. and post-B.D. students beginning the Monday nearest June 15 and continuing for twelve consecutive weeks. This quarter of training is accredited by the Institute of Pastoral Care, Inc.

2. The Master of Theology degree with a major in Pastoral Care is a calendar year program beginning June 15th, September 15th, or February 1st, and includes a summer quarter of clinical training full-time in one of the affiliated hospitals with such clinical training continuing on a half-time basis through the academic year. To the 14 credits the candidate receives for his clinical training are added 16 credits for coursework in The Divinity School. (See pages 41 and 42 of The Divinity School Bulletin for 1965-66 for general requirements for the degree and course work in Pastoral Care). Some tuition scholarship money is available and several traineeships are provided through the cooperating hospitals.

3. A one-year certificate or non-degree program is available for a limited number of candidates who hold the B.D. degree. These candidates are enrolled as Special Students in The Divinity School and may take a course or two each semester but the focus of their training is clinical.

4. A second or residency year is available for those men who have either the Master's degree in Pastoral Care or have completed an internship year. The residency may be taken at any one of the three cooperating hospitals. Fellowships are available.

5. A two-week clinic in Pastoral Care is provided each summer as part of The Divinity School's in-service training program. See p. 19.

For further information concerning any of these programs write to Dr. Richard A. Goodling, Director, Programs in Pastoral Care, The Divinity School.

Student Life

DIVINITY SCHOOL CHOIR

A student organization of long standing is the Divinity School Choir. Membership in the Choir is open to all qualified students. The Choir sings regularly for the daily services in York Chapel and at special seasonal programs and services. New members are chosen by informal auditions held during the first week of fall classes. Auditions are arranged for all who are interested.

THE COORDINATING COUNCIL FOR COMMUNITY LIFE

Beginning with the 1964-65 academic year the Student Government Association was superceded by a Coordinating Council for Community Life. This Council is composed of representatives from the student body, faculty, administration, Divinity Dames, and the doctoral students in religion.

The purpose of the Council is, as the name implies, to coordinate the activities of the Divinity School community. Realizing that there are many shared interests and concerns within the community which cannot be expressed fully in a student body organization alone, the Council was created by a joint student-faculty committee and approved by participating groups.

The shared interests and activities of the community are expressed through the several committees of the Council. The Council has coordinating, reviewing, and initiating powers in matters affecting the common life.

Student members of the Council are elected by the three B.D. classes, the M.R.E. candidates, the Th.M. candidates and the student pastors. A student activity fee is collected at the beginning of each academic year to support the activities of the community. The fee, in recent years, has been six dollars ($6.00). The funds are administered through committees and are spent on such projects as missions, social action, social events, and student publications.

DIVINITY DAMES

The wives of Divinity School students have an organization through which there is opportunity for informal fellowship during the period of the students' residency. For the past several years lecture courses, running for two-week periods in the fall and spring semesters, have provided instruction in various aspects of parish life

and in theological and Biblical subjects and issues. The Dean and faculty are concerned to assist the wife to understand her husband's vocation and to participate appropriately.

STUDENT PUBLICATIONS

In cooperation with the Dean's Office, students publish a faculty and student *Directory*. A monthly paper entitled *Response* is published under their editorship.

Admission and Requirements for Degrees

Requirements for Admission

THE Divinity School is a fully accredited member of the American Association of Theological Schools, and is one of twelve accredited seminaries of The Methodist Church. Candidates for admission must hold the degree of A.B., or its equivalent, based upon four years of work beyond secondary education, in a college which is approved by one of the regional accrediting bodies, and their college records must be such as to indicate their ability to carry on graduate professional studies. They will be admitted without examination on presentation of an official, satisfactory transcript of college and all other academic credits which they may have secured. Recommendations from five responsible persons are required. Women will be admitted on the same basis as men.

Applications are evaluated with a view both to the academic achievement of the candidate and with reference to his personal and professional qualifications for the Christian ministry. While an academic average of less than "B—" is ordinarily regarded as a disqualification for admission, nevertheless, the Committee on Admissions is impressed with a rising curve of achievement in the undergraduate program and makes its decision on the basis of the whole body of credentials of an applicant, including supporting letters of reference.

The applications of students from foreign countries will be considered, each on its own merits, the general principle being that training equivalent to that of a baccalaureate degree from an accredited American college must have been secured.

In addition to an adequate academic preparation, applicants must satisfy the Faculty as to their Christian character and purpose. A formal application blank may be secured from the office of the Divinity School. This must be filled out and returned by all candidates for admission. Applications received after May 1 cannot be assured of admission, financial aid or dormitory rooms for the ensuing academic year. *A minimum of thirty days is required to process any application, in many cases longer.*

All persons admitted to the Divinity School are required to report to the Student Health Service, Duke Hospital, for physical examina-

tion on days and at hours specified at the time of matriculation. No admission is final until approved by the Student Health Service, which requires a certificate of immunization and general health to be submitted not earlier than July 1 and not later than August 1. Applicants are also required to take certain tests administered by the Bureau of Testing and Guidance and by the Theological School.

Persons who do not matriculate at the time for which they were originally admitted forfeit admission and must be formally readmitted. A student who withdraws from the Divinity School and desires to return at a later date must file with the Dean a written request for a leave of absence.

Applicants are required on notification of admission to signify their acceptance within three weeks, and to pay an admission fee of $30.00. (Make check payable to Duke University and send to the Office of the Dean of the Divinity School.) This fee is applied to the regular first-term bill if the student matriculates; if he fails to do so, the fee is forfeited. This does not apply to the Summer Session.

Under the terms of the Selective Service Act, as it now stands, pre-enrollment for later formal admission may be granted to persons who meet the Divinity School standards and requirements for admission. Applications for pre-enrollment may be addressed to the Office of the Dean. Pre-enrolled students must send transcripts of each year's college work by June 15th of each year in which they are pre-enrolled. *Pre-enrollment does not guarantee final admission,* and a person who has been pre-enrolled for any length of time must send a transcript of work by February 1 of the year in which admission is sought. This must be accompanied by a letter from the college dean or other approved reference certifying to continued academic acceptability, good character and conduct.

PRE-SEMINARY CURRICULUM

The Divinity School, in substantial agreement with the standards of the American Association of Theological Schools, recommends that prospective candidates for admission keep in mind the desirability of including the following in their undergraduate curriculum:

It is suggested that a student should acquire a total of 90 semester hours or complete approximately three-fourths of his college work in the areas listed below. No work done towards a first college degree may be used toward a Divinity School degree.

Basal Fields	*Semesters* (At least the number indicated)
English Literature, composition and speech, and related studies	6
History, ancient, modern European, and American	3
Philosophy, orientation in history, content and method	3
Religion	3
Psychology	1
A foreign language Greek, Latin, Hebrew, French and German are especially recommended.	4
Natural Science	2
Fundamentals of Speech	1

TRANSFER OF CREDIT

Transfer of credit from theological schools accredited by the American Association of Theological Schools is provided for by the Faculty of the Divinity School under certain conditions. Applications for transfer of credit will be ruled upon by the Committee on Admissions, and will be subject to evaluation in terms of the prevailing requirements of the Divinity School for graduation. *Ordinarily, credit from another institution will not be granted in amount exceeding one-half of the total credits required by the Divinity School for graduation.* A student applying for transfer of credit in excess of this amount may be required to pass such examinations as the Committee on Admissions may prescribe. In each case a letter of honorable dismissal from the school from which transfer is made is required along with transcript of academic credits.

ADVANCED STANDING

Advanced standing allows entering students to begin work in any given field at a level higher than that of the core curriculum, or to substitute a specialized or cognate course for a core requirement.

Entering students with substantial undergraduate preparation in areas closely related to required courses of the Divinity School core curriculum may be eligible for advanced standing. While a student may be eligible for advanced standing in any subject, it is especially pertinent where students offer undergraduate majors of superior quality in Bible, religion, or philosophy. Students entering with six or more semester hours in the Greek language should consult the catalogue under "Language Study" for a description of special privileges pertaining to their case. The fields in which entering students, by virtue of previous undergraduate study, are most likely to qualify for advanced standing are: Old Testament, New Testament, Types of Religious Philosophy, Church History.

An entering student who offers not less than *six* semester hours of college credit, with a grade of "B" or better in one or more of these areas may ordinarily anticipate advanced standing in corresponding required courses of the Divinity School core curriculum. All final transcripts will be studied, and advanced standing will be accorded to those who qualify under this provision.

A student who offers not less than three semester hours of college credit with a grade of "B" or better in one or more of these areas may, for satisfactory performance in a qualifying examination in the discipline, be granted advanced standing. Entering students who qualify, under this provision must, at the time of application, make request for the privilege of sitting for such an examination.

The core requirement for the entering, or junior student, with

advanced standing is ordinarily satisfied by one of the following substitutions:

For Old Testament 11: O.T. 101; 106 A, B, C, D; 196; 201; 202.

For New Testament 18: N.T. 103; 104; 105; 109; 116 A, B, C; 117 A, B; 225.

For Types of Religious Philosophy: C.C. 16.

For Church History 13: C.H. 137; 138; 331; 332.

For Church History 14: C.H. 85; 250; 330.

ADMISSION ON PROBATION

1. Applicants for admission who are graduates of non-accredited colleges will be considered on their merits. Ordinarily, such applicants must show that they have attained a superior average for a four-year college course.

Admission of such persons will, in every case, be *on probation*.

2. Applicants for admission who are graduates of accredited colleges but whose college transcripts do not fully meet Divinity School standards may be admitted *on probation* if their recommendations otherwise justify admission.

Probation means:

a. Students who, during the first year of Divinity School work maintain less than a "C" average, including one or more failures, ordinarily will be required to withdraw from the School.

b. Students admitted on probation may carry only limited schedules of work, the amount to be determined by the Dean of Students.

c. A student admitted on probation ordinarily shall not be admitted for advanced standing.

Students whose work after admission is not satisfactory may be placed on probation.

MINISTERIAL AND PROFESSIONAL QUALIFICATIONS

All students who are admitted to academic study in The Divinity School are subject to the established order of administrative regulations of the University and the accepted standards of personal conduct it enjoins; continuance in the School is conditioned upon acknowledgment of and compliance with such regulations and standards.

In particular, the University and the Divinity School expect and require students in candidacy for degrees, leading to a ministerial vocation, not only to exemplify the dignity of their calling, but to exhibit attitude and conduct conformable with the recognized standards of their Christian profession. While no "honor system" relating to academic integrity is formalized within the Divinity School, application for and admission to course of study assume the student's

assent to full compliance with recognized standards of integrity in the fulfillment of academic tasks.

On this prior understanding, therefore, the University reserves the right, and matriculation by the student is a concession to this right, to compel the withdrawal of any student whose conduct at any time is not satisfactory to the University, even though no specific charge is made against the student.

As a graduate professional school of theology, the Divinity School expects, on the part of the student, an increasing manifestation of maturity and professional purposiveness in discharge of personal and academic responsibilities appropriate to the level of advanced academic work leading to the high and exacting demands of the Christian ministry. Since personal and professional qualifications for the ministry will be considered in evaluating the candidacy of all students for degrees, students whose persons, progress, or development indicate that they are not suited to the work of the ministry will not be allowed to continue in the School.

FACULTY ADVISERS

Each entering student is assigned to a Faculty Adviser at the time of registration and must report to his Adviser. A student must consult with his Adviser in order to determine his course and cannot complete his registration without the signature of his Adviser. It is understood that all students will continue to consult their advisers at the time of registration throughout the period of their academic work.

ENGLISH DEFICIENCY

Students whose English testing scores show marked deficiency or who are reported by their instructors as deficient in English usage will be required to take Remedial English in addition to meeting other requirements for the Bachelor of Divinity degree.

SPEECH DEFICIENCY

At any time in his academic course—on evidence of deficiency in the fundamentals of speech, such as voice or diction—a student may be required to enroll for Speech 34, Workshop in Communication.

Advanced standing does not apply to Professional Courses listed as requirements for Vocational Groups.

Requirements for Degree of Bachelor of Divinity

Course requirements are of three kinds: Those of the core curriculum, professional courses, and practicums related to field work. Courses of the core curriculum are required of all students; the professional courses required vary with the prescription of the five Vocational Groups. Practicums are required of students engaged in regular or summer field work.

REQUIREMENTS FOR THE JUNIOR YEAR

1. Courses of the Core Curriculum.

O.T. 11.	Introduction to the Old Testament I	3 s.h.
C.H. 13.	History of the Church to the Protestant Reformation	3 s.h.
C.H. 14.	History of Modern European Christianity	3 s.h.
N.T. 18.	Early Christian Life and Literature	3 s.h.
*T.S. 20.	Types of Religious Philosophy	3 s.h.
H.T. 21.	Theology of the Protestant Reformation	3 s.h.

2. Professional Courses.

P.S. 10.	I. The Church and the Minister's Vocation	1 s.h.
P.C. 26.	II. Introduction to Pastoral Care	3 s.h.
C.W.40.	VII. The Church at Worship	3 s.h.

Required of all students of the Junior Year

3. Field Work Practicums.

Field Work Practicum I (For Student Pastors)	1 s.h.
Field Work Practicum II (For Summer Endowment)	1 s.h.

REQUIREMENTS FOR THE MIDDLER YEAR

1. Courses of the Core Curriculum.

O.T. 12.	Introduction to the Old Testament II	3 s.h.
N.T. 19.	Introduction to New Testament Theology	3 s.h.
†W.C. 24.	Philosophy of the Christian World Mission	2 s.h.
C.E. 27.	Christian Ethics	3 s.h.
A.C. 28.	History of American Christianity	3 s.h.
C.T. 32.	Christian Theology I	3 s.h.
C.T. 33.	Christian Theology II	3 s.h.

2. Professional Courses.

Pr. 29.	III Sermon Construction—Theory	2 s.h.
Pr. 30.	V Sermon Construction—Practice	1 s.h.

Professional Courses III and V required of all students in Vocational Groups I, III, IV, VI, and, on occasion, II.

REQUIREMENTS FOR THE SENIOR YEAR

I. Professional Courses.

C.Ed. 22.	IV Theology and Christian Nurture	3 sh.
C.P. 23.	VI The Care of the Parish	3 s.h.
Pr. 31.	VIII Preaching (practice)	1 s.h.

Professional Course IV required of all students in Vocational Groups, I, II, III, and VI. Professional Course V required of all students in Vocational Groups I, III, IV, V, VI, and, on occasion, II.

* Advanced Standing entitles the student to elect C.C. 16 *Contemporary Western Culture.*
† Required of Vocational Groups I, II and III.

Professional Course VI is required of students in Vocational Groups I, II, and IV.

Professional Course VII is required of students in Vocational Groups I, II, III, IV, and VI.

Professional Course VIII is required of students in Vocational Group I.

II. Vocational Groups.
Each student, not later than the end of the junior year, shall choose one of the six Vocational Groups listed on pages 33 to 35 and will meet the vocational requirements of the group chosen.

III. Vocational Qualifying Finals.
Each senior student shall complete his academic program during his senior year by registering for and fulfilling the requirements of the qualifying final discipline pertaining to his chosen vocational group. For description see page 35.

IV. Free Electives.
The student will choose a sufficient number of courses to make up the total of 90 semester hours required for graduation. Language courses count as free electives.

V. English Bible. A knowledge of the content of the English Bible requisite to the discharge of the teaching and preaching task of the Christian ministry is required and will be tested. Such proficiency must be demonstrated by the end of the student's senior year. Successful completion of Old Testament English Bible I and New Testament English Bible II (see pp. 43, 44) fulfill this requirement. A student may, however, sit for the final examinations in these courses and by passing them fulfill the requirement, in which latter case he receives no academic credit.

Suggested Distribution by Semesters of Required Courses

FIRST (JUNIOR) YEAR

First Semester	*Semester Hours*
Required in this Semester	
10. I The Church and Minister's Vocation	1
11. Introduction to the Old Testament I	3
13. History of the Church to the Protestant Reformation	3
18. Early Christian Life and Literature	3
20. Types of Religious Philosophy*	3
Field Work Practicum I (Student Pastors)	1

Second Semester	*Semester Hours*
Required in this Semester	
14. Modern European Christianity	3
21. Theology of the Protestant Reformation	3
26. II Introduction to Pastoral Care	3
Field Work Practicum II (Summer Field Work)	1
40. VII The Church at Worship	3

15 hours is the normal program, not over 16 hours may be scheduled in either semester.
*Students with Advanced Standing may enroll in C. C. 16, *Contemporary Western Culture.*

SECOND (MIDDLER) YEAR

First Semester	*Semester Hours*
Required in this Semester	
19. Introduction to New Testament Theology	3
24. Philosophy of the Christian World Mission†	2
28. History of American Christianity	3
29. III Sermon Construction—Theory	2
32. Christian Theology	3

Second Semester	*Semester Hours*
Required in this Semester	
12. Introduction to the Old Testament II	3
27. Christian Ethics	3
30. V Sermon Construction—Practice	1
33. Christian Theology	3

Professional Courses I and II required of all students.
Professional Course III, required of Vocational Groups 1, 3, 4, 6, and on occasion 2.
Professional Course V, required of all students in Vocational Groups 1, 3, 4, and 6, and on occasion 2.
†Required of students in Vocational Groups 1, 2, 3.

THIRD (SENIOR) YEAR

First Semester	*Semester Hours*
22. IV Theology and Christian Nurture	3
C.P. 23. VI The Care of the Parish	3
Pr. 31. VIII Preaching (Practice)	1

Professional Course IV, required of all students in Vocational Groups 1, 2, 3, and 6.

Schedule of Required Courses

FIRST YEAR—FIRST SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		N. T. 18	N. T. 18	P. S. 10	N. T. 18	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		C. H. 13	Assembly	C. H. 13	C. H. 13	
12:00	C. C. 16 T. S. 20		C. C. 16 T. S. 20		C. C. 16 T. S. 20	
2:00	O. T. 11	†Practicum	O. T. 11		O. T. 11	
3:00						

FIRST YEAR—SECOND SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		C. H. 14	C. H. 14		C. H. 14	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		VII C.W. 40	Assembly	VII C.W. 40	VII C.W. 40	
12:00						
2:00	II. T. 21	‡Practicum	H. T. 21		H. T. 21	
3:00	II P. C. 26		II P. C. 26		II P. C. 26	

†For Student Pastors, additional sections of Practicum are available.
‡For Duke Endowment Students, additional sections of Practicum are available.
Professional Courses I and II required of all students.

SECOND YEAR—FIRST SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		C. T. 32	C. T. 32		C. T. 32	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		A. C. 28	Assembly	A. C. 28	A. C. 28	
12:00		III Preaching 29		III Preaching 29		
2:00	N. T. 19	W. C. 24	N. T. 19	W. C. 24	N. T. 19	

SECOND YEAR—SECOND SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		C. T. 33	C. T. 33	V Preaching 30	C. T. 33	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		C. E. 27	Assembly	C. E. 27	C. E. 27	
12:00						
2:00	O. T. 12		O. T. 12		O. T. 12	

THIRD YEAR—FIRST SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10						
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		IV C. Ed. 22	Assembly	IV C. Ed. 22	IV C. Ed. 22	
12:00		VI C. P. 23	VIII Pr. 31	VI C. P. 23	VI C. P. 23	
2:00						

VOCATIONAL GROUPS

In recognition of the existing and growing diversity of function within the 20th century Protestant Christian ministry, the program of studies leading to the B.D. degree has been designed to afford variability of emphasis within a basic unity. The core curriculum of basic theological studies provides uniform requirements for all. Variability of emphasis derives from the carefully tailored requirements peculiar to each vocational group. Election of a vocational group is election of a cluster of required courses regarded as providing adequate conversancy with a range of subject matter most pertinent to the special emphasis of the vocational group.

Each student shall choose his vocational group during the second semester of his first or Junior year and give notice of his choice to the office of the Dean of Students not later than May 1.

The student is urged to consult his faculty adviser in making his selection of a vocational group. Students electing Vocational Group I will be certified for that group by the Dean of Students. Students electing Vocational Group II shall have the approval of Professor Kale; those electing Vocational Group III, the approval of Professor Lacy; those electing Vocational Group IV, the approval of Professor Goodling. Students electing Vocational Group V shall have the approval of the Dean and must offer an average of "B minus" for the academic record of their junior year. Students electing Vocational Group VI must have the approval of the Dean of Students. Choice of a vocational group is regularly subject to review of the Dean, and the right to require alteration of election is reserved.

A qualifying final discipline is attached to each vocational group and constitutes a requirement for graduation. Open to students in their senior year, it carries two semester hours credit. See page 35.

Electives in sufficient amount to complete 90 hours for graduation will be taken.

I. THE PARISH MINISTRY

A student electing Vocational Group I shall plan his program to include one course at a level higher than the core requirement from six of the following areas:

Biblical Studies
Care of the Parish
Christian Education
Historical Studies
Pastoral Care
Church at Worship
Theological Studies

This Vocational Group requires the following Professional Courses: III, IV, V, VI, VII, VIII, and Philosophy of Christian World Mission.

II. THE MINISTRY OF CHRISTIAN EDUCATION

A student should plan his courses so as to include three of the following Christian Education courses: 125, 126, 161, 162, 169 and at least one course from among the following: 164, 165, 166. In addition the student should take one advanced course in each of the following fields: Christian Theology, Biblical Studies, American Christianity, Historical Theology or Church History, Christian Ethics, Pastoral Care, and Worship.

This Vocational Group requires the following Professional Courses: IV, VI, VII, and Philosophy of Christian World Mission.

Those students planning to pursue the Ministry of Christian Education within the Parish Ministry may also in certain circumstances be advised to take Professional Courses III and V.

III. THE MINISTRY OF MISSIONS

The student should plan his course so as to include the following courses in Missions and related subjects: W.C. 24, 133, and 156, H.R. 158, C.E. 190. In addition he should take at least one advanced course in Biblical Studies; and one in Christian Theology or Historical Theology; and at least one of the following courses, depending on his field or anticipated service: H.R. 179, 180, 182, or C.T. 213 (with appropriate substitutions if these are not offered).

Professional Courses III, IV, V, and VII are required of this group.

IV. THE MINISTRY OF PASTORAL CARE

In addition to the required course in Pastoral Care, P.C. 26, the student should plan his program so as to include the following: P.C. 170; 171 or 172; 177; 174 or 188; C.T. 125 or T.S. 102; H.T. 121 or one advanced course in Church History. Students must also take one advanced course in *each* of the following areas: Christian Theology; Christian Ethics or Christianity and Culture; Biblical Studies.

Professional Courses III, V, VI*, and VII are required of this group.

V. THE MINISTRY OF TEACHING

A student electing Vocational Group V shall declare his major during the second semester of his first or junior year and shall select for concentration five of the areas listed below of which one shall be the designated major in which he shall take not less than nine semester hours. He shall in addition, ordinarily, take not less than five semester hours in each of the other four areas. Normally, the above requirements are met by courses of advanced level; however, introductory courses of the Core Curriculum, not already taken as standard requirements of the Junior and Middler years may be included as fulfilling the major and minor areas of study.

American Christianity
Christian Education
Christian Ethics
Christianity and Culture
Church History
Historical Theology
History of Religions and World Christianity
New Testament
Old Testament
Theology and Philosophy of Religion

Professional Courses III and V (or IV and VII).

VI. THE MINISTRY TO THE CAMPUS

Students electing this group are required to take at least one advanced course in Christianity and Culture, and one advanced course in Pastoral Care. They are also required to take C.Ed. 149. In addition, they are advised to select electives in consultation with the director of Vocational Group VI in such fashion to maintain balance between the several disciplines.

Students of this group are required to serve an apprenticeship which may be accomplished in either of two ways:

1. A student may work part-time for one academic year as commuting active staff member of a denominational college chaplaincy program currently operating on one of the campuses within a fifty-mile radius of Duke University. Specific assignments and terms of employment as permitted by the academic load of the students would, in such cases, be arrived at in consultation with the director of Vocational Group VI and the Dean of Students.

2. A student may apply to an appropriate foundation (or other comparable agency) for grant to work full time for a year as a Seminary intern in a college campus situation and, if he is awarded such a grant, fulfill in this way the apprenticeship requirement. Students of Group VI are encouraged to apply for such a grant before proceeding otherwise.

* C.Ed. 161 or 162 may be substituted for Professional Course VI.

A student's association as intern or member of chaplain's staff will be recorded on his transcript. Regular reports of the student's activity and performance are to be made by the student and by his immediate supervisor during the term of his work as intern or staff member.

Professional Courses III, IV, V, and VII are required of this group.

SENIOR VOCATIONAL QUALIFYING FINALS

Each student must, as a requirement for graduation, complete the qualifying discipline of his chosen Vocational Group as described below:

For Vocational Group I: On the basis of Biblical materials designated by instructors and developed according to method and standards described in exemplary lectures given by a faculty panel, a student of this group is to provide the following: (a) a complete, written exegesis of an assigned Biblical text, (b) a written explanation of the theology implicit and explicit in the passage, together with a written statement of his credo regarding the theology discussed, and (c) the manuscript of an expository sermon embodying the exegetical insights and theological position set forth in (a) and (b).

For Vocational Groups II and III: A student of either of these groups presents to a specified committee of the faculty an essay on an assigned subject. For credit the essay must, in the opinion of the committee, demonstrate the relation of the student's choice of particular field to his total program of study.

For Vocational Group IV: Each student electing this group must complete the seminar in the Theology of Pastoral Care, staffed by an interdisciplinary committee of the faculty, and present to the committee a paper on an assigned subject during the course of the seminar.

For Vocational Group V: A student of this group must take a seminar involving coalition between at least two of the disciplines of historical, Biblical, and theological studies. Opportunity and responsibility for conducting class sessions through reports, discussion-direction, and consultation will afford distinctive experience in the teaching situation.

For Vocational Group VI: Students of this group are not required to take a qualifying final but must fulfill the demands of an apprenticeship described above.

Students of Groups I and V normally fulfill the above requirements during their fifth or sixth semester of residence. Students of Groups II and III normally receive assignments early in the fifth semester of residence and complete the assignment before graduation, although the date by which assignments must be completed may be set at the discretion of the student's committee. Students of Group IV normally take their seminar in the sixth semester of residence. The qualifying discipline for each group carries, when successfully completed, two semester hours' credit.

ADMINISTERING THE CURRICULUM

For the administration of the curriculum the following regulations have been adopted:

Full-time students must take the required courses as specified for the respective semesters.

The schedules of all students are subject to review and approval of the Dean and the Committee on Academic Standing.

Students in candidacy for the B.D. degree who accept student pastorates are advised that their program of study will require a fourth year. Students with pastoral charges will enroll for not less than eight nor more than twelve semester hours in any given semester.

Ordinarily, a student enrolled in candidacy for the B.D. or M.R.E. shall enroll for no less than eight semester hours in any semester.

Not over 30 semester hours of Summer Session work may be credited toward the degree of Bachelor of Divinity.

The status of "special student" may not be granted simply to permit avoidance of the schedule of required courses. Every request for this classification will be carefully investigated and approval of the Dean is required.

A fee of $15.00 is charged for auditing any course except where a student is already paying regular University fees. Permission to audit requires the approval of the Dean and the instructor concerned.

Student pastors and students working under the Duke Endowment Summer Field Work program of the Rural Church, are required to take one of the Field Work Practicums.

LANGUAGE STUDY

A student who takes six hours of N.T. language may be excused from either N.T. 18 or N.T. 19; one who takes six hours of O.T. language may be excused from either O.T. 11 or O.T. 12, depending on the year in which he takes Hebrew.

A part-time student who desires to begin the study of Greek in the first year may postpone the required course in Old or New Testament.

For a student planning to take both Greek and Hebrew: the Greek may be continued in the second year by postponing N.T. 19 in the fall semester and waiving O.T. 12 in the spring semester.

Suitable entry will be made on the permanent record of any student who is granted permission to deviate from the requirements in the matter of language.

GRADUATION CREDITS

It is the responsibility of each student to see that he meets all requirements for graduation, and to take his courses in proper sequence.

He is also responsible for seeing that any special permission granted him to deviate from the normal program is properly recorded in his personal files. Deviations from a normal academic program must be approved by the Dean of Students as representative of the Dean of the Divinity School.

GRADING SYSTEM

The grading system of the Divinity School employs the letters A, B, C, D, and F, which have been defined as follows: A = Excellent; B = Superior; C = Average; D = Inferior; F = Failure; WP = Withdrew Passing; WF = Withdrew Failing; WI = Withdrew Illness and I = Incomplete; P, Passed. (See below.) No percentage equivalents are stated. A student is expected to maintain an average of C.

In all courses where the instructor considers attendance a necessary part of the work of the course, a student may not receive a grade of over C if his absences total 12% of the regular class periods, and if the absences total 24% of the class periods he may not receive credit for the course.

INCOMPLETES

A student may, with the permission of the instructor concerned, petition the Dean of Students to receive a grade of "incomplete" in a course. Such permission may be granted when a student, through some circumstance beyond his control, such as illness, has been hindered from meeting the course requirements. No "incomplete" is recorded without permission in writing from the Dean of Students. Ordinarily, an "incomplete" will not be approved in the case of students completing their academic work in the fall semester. An "Incomplete" automatically becomes an "F" unless it is removed through completion of assigned work by the following dates:

For "Incompletes" incurred in fall semester courses, March 15, following

For "Incompletes" incurred in spring semester courses, October 15, following

For "Incompletes" incurred in summer courses, October 15, following.

CHANGE OF COURSE OR WITHDRAWAL

A student is permitted to change his registration for course work without incurring a penalty no later than completion of the second meeting of the course from which he desires to withdraw or, correspondingly, of the course to which he seeks admission. All such changes shall be approved by a member of the Registration Committee.

No student shall be permitted to drop a course after the expiration of one-third of the period of instruction of the course without incurring failure, except for causes adjudged by the Dean or Dean of Students to be beyond the student's control. Conditions of emergency and not considerations of convenience shall be regarded as determinative in considering requests.

GRADUATION WITH DISTINCTION

Students who achieve a grade point average of 3.75 (A, 4; B, 3; C, 2; D, 1) for over-all academic record in the Divinity School are granted the degree of Bachelor of Divinity, *summa cum laude.* Students with a grade point average of 3.5 are awarded the degree, *magna cum laude.* Such distinction is specified on their diplomas.

Requirements for the Degree of Master of Religious Education

THE course of study leading to this degree is designed for persons desiring to engage in various forms of Christian Education.

Candidates for this degree must hold the degree of A.B. (or its equivalent), based upon four years of work beyond secondary education, in a college which is approved by one of the regional accrediting bodies, and with academic and personal records which afford promise of competence in this area of service. The course of study will be especially useful for individuals who have had one or more years of experience in Christian Education and desire further training. Candidates for this degree will be limited in number, and individuals interested are urged to apply for admission well in advance of the opening of the academic year. All work offered for this degree, whether in the regular year or in summer sessions, must be completed within a period of six years from the date of beginning.

It is desirable that each applicant for admission show a "B" average in his college work. An applicant must show a college average of not less than "B—."

PREREQUISITES

Three of the following five prerequisite studies must have been taken by the candidate prior to his admission to the Divinity School or must be secured, without credit toward the M.R.E. degree, after being admitted:

General Psychology	3 s.h.
Sociology	3 s.h.
Education	3 s.h.
Philosophy	3 s.h.
Religion	3 s.h.

GENERAL REQUIREMENTS

Sixty semester hours of graduate-professional work are required for graduation. Not more than twelve semester hours of this work may be taken in approved summer sessions.

No credits are allowed for undergraduate courses. However, in approving plans of study leading to this degree, consideration will be given to earlier work taken in the fields of Biblical studies and Christian Education provided such courses were taken in the Junior

and Senior years in accredited four-year colleges. Also, where candidates for the degree have been engaged professionally as Directors of Christian Education for not less than twelve months prior to entering the Divinity School the amount of Field Work may, upon recommendation of the Director of the M.R.E. program and the approval of the Dean, be reduced to not less than three hours of Project or Directed Field Work during the period required for completing requirements for the degree.

A student who secures credit for 15 semester hours each semester will be in line for graduation at the end of two academic years. The amount of work allowed in each semester may not exceed that permitted in the B.D. curriculum.

Candidates must also pass the English Bible examinations or equivalent described under requirements for the B.D. degree. Normally these examinations are taken in the second year of the M.R.E. program, but, with permission of the Director of the M.R.E. program, may be taken during the student's first year of residence.

COURSE REQUIREMENTS FOR THE M.R.E. DEGREE

Subject	*Required Semester Hours*
Biblical Studies (O.T. and N.T.)	9 to 12
Church History, Historical Theology and American Christianity	9 in two or more of these fields
Christian Theology	3 to 6
Philosophy of Religion or Christian Ethics	3
Worship	3
Pastoral Care	3
Christian Education (including missionary education)	11
Christian Education Practicum	3
Required Hours	44 to 50
Electives	10 to 16
TOTAL	60

Requirements for the Degree of Master of Theology

THE course of study leading to the degree of Master of Theology is designed for graduates of accredited theological schools who desire to continue or resume their theological education for enhancement of professional competence in selected areas of study. Enrollment in the Th.M. program is open to a limited number of students who have received the B.D. (or the equivalent) with superior academic records.

GENERAL REQUIREMENTS

The general requirements for the degree of Master of Theology are:

(1) thirty semester hours of advanced studies, with a minimum grade of "B" in each course;

(2) superior performance in a comprehensive examination covering the major and minor areas of study;

(3) residence for one academic year.

There are no general language requirements, but classical or modern languages may be required for certain courses (for example, Hebrew or Greek in Biblical studies).

THE PROGRAM OF STUDY

At least twelve of the required thirty hours must be taken in one of the basic divisions of study (Biblical, Historical, Theological, or Professional) which shall be designated as the candidate's major; and at least six hours in another of the divisions which shall be designated as the candidate's minor. No more than twelve hours may be taken in summer sessions. No more than six semester hours of work completed in another accredited institution may be transferred and credited toward the degree. Ordinarily, no more than six hours may be taken through directed reading, and no more than three in any one semester or summer term. In the area of Pastoral Care, up to fourteen hours may be taken through clinical training.

The major in Pastoral Care requires a calendar year. The candidate normally begins his training June 15 with 12 weeks of full-time clinical training.

Each student will plan his program of courses and directed reading or clinical training with the guidance of a committee of two to be appointed by the Director of the Master's Program. The committee will include a professor in the student's major area of interest, who will act as chairman, and a professor in the minor area. The chairman, in consultation with the Director and the other member of the committee, will prepare, administer, and evaluate the comprehensive examination.

The comprehensive examination will be given at the close of the course of study for the degree, ordinarily in May or September.

The entire program of studies and comprehensive examination should be completed within twelve months. In exceptional cases, the time limit may be extended, but in no case beyond three years.

Courses of Instruction*

REQUIRED courses are numbered from 10 to 70. Elective courses carrying credit in the Divinity School only are numbered from 71 to 199. Courses approved for credit in both the Divinity School and the Graduate School of Arts and Sciences are numbered above 200. Lists of courses to be offered in any semester will be available at the time of each registration.

I. Biblical Studies

OLD TESTAMENT

OLD TESTAMENT ENGLISH BIBLE I. (Meets two hours weekly.) 1 s.h. MR. EFIRD

11. INTRODUCTION TO THE OLD TESTAMENT I.—The origin, literary forms, and contents of the books of the Old Testament in their geographical and historical setting on the Exile. 3 s.h. MR. EFIRD

12. INTRODUCTION TO THE OLD TESTAMENT II.—Introduction to and interpretation of Exilic and post-Exilic prophecy, Psalms, wisdom literature, the Chronicler, apocalyptic, and the Apocrypha. 3 s.h. MR. STRUGNELL

101. POST-EXILIC PROPHECY.—A study of the post-Exilic prophets from Ezekiel to Daniel, with special reference to Messianic prophecy and related theological problems. 2 s.h. MR. STRUGNELL

106. EXEGESIS OF THE ENGLISH OLD TESTAMENT.—A. A book of the Pentateuch; B. A prophetical book; C. A historical book; D. Selected poetical materials. (O.T. 106 A, O.T. 106 B, O.T. 106 C, and O.T. 106 D are separate courses, offered in different semesters.) Prerequisite: O.T. 11 or the equivalent. 2 s.h. STAFF

196. THE BIBLE AND RECENT DISCOVERIES.—A survey of the contribution of the cultural setting of the Bible as an aid to its understanding. 3 s.h. MR. STRUGNELL

201-202. FIRST HEBREW.—The principles and structure of the Hebrew language with translation of selected Old Testament narratives. One year of Greek prerequisite. 6 s.h. MR. EFIRD

207. SECOND HEBREW.—Historical Hebrew grammar with reading and exegesis of Old Testament prose (Pentateuch and historical books in alternate years). First semester. 3 s.h. STAFF

208. SECOND HEBREW.—Historical Hebrew grammar with reading and exegesis of Old Testament poetry (Prophets and the Writings in alternate years). Second semester. 3 s.h. STAFF

209. BIBLICAL THEOLOGY.—A study of the Old and New Testaments in regard to their theological relationship. Prerequisite: O.T. 11 and N.T. 19. 3 s.h. MR. ANDERSON

301. THE THEOLOGY OF THE DEAD SEA SCROLLS.—A study of the religious ideas of the Scrolls in relation to the theology of the Old and New Testaments. Prerequisite: O.T. 11. 3 s.h. MR. STRUGNELL

* On approval of the Dean, courses offered in the Graduate School of Arts and Sciences other than those approved for credit in the Divinity School may be approved for credit in individual cases, provided no equivalent course is offered in the Divinity School; each case to be decided on its merits.

302. STUDIES IN THE INTERTESTAMENTAL LITERATURE.—Selected documents of the Apocrypha and Pseudepigrapha examined exegetically and theologically in their relation to post-Exilic Judaism. Prerequisite: Permission of the instructor. 3 s.h. MR. ANDERSON

304. ARAMAIC.—A study of the Aramaic portions of the Old Testament, and selected passages from the Targums, Midrashes, and Talmuds. 3 s.h. MR. STINESPRING OR MR. STRUGNELL

305. THIRD HEBREW.—An interpretative study of late Hebrew prose, with readings from Chronicles, Ecclesiastes, and the Mishnah. 3 s.h. MR. STINESPRING

306. LANGUAGE AND LITERATURE OF THE DEAD SEA SCROLLS.—A study in interpretation. Prerequisite, a knowledge of Hebrew. 3 s.h. MR. STRUGNELL

307. SYRIAC—A study of the script and grammar, with readings from the Syriac New Testament and other early Christian documents. Some knowledge of Hebrew and Aramaic prerequisite. 3 s.h. MR. STINESPRING

309. HISTORY OF THE ANCIENT NEAR EAST.—A specialized study of the civilizations of Egypt, Palestine, Syria, and Mesopotamia in the light of Biblical archaeology. 3 s.h. MR. STINESPRING

310. OLD TESTAMENT PROPHECY.—The prophetic movement in Israel with special emphasis on the theological standpoint of the prophets of the eighth century B.C. Prerequisites: O.T. 11 and O.T. 12. 3 s.h. MR. STINESPRING

*HISTORY OF ART 215. RELIGIOUS ART OF THE ANCIENT NEAR EAST.—The development of art, particularly architecture and sculpture, as the material expression of religious ideas in Egypt, Mesopotamia, and in part Syria and Palestine to the Persian conquest. 3 s.h. MR. MARKMAN

*HISTORY OF ART 216. RELIGIOUS ART OF THE CLASSICAL WORLD.—The religious art, particularly architecture and sculpture, of Greece and Rome with special emphasis on the monuments in the Near East. 3 s.h. MR. MARKMAN

NEW TESTAMENT

NEW TESTAMENT ENGLISH BIBLE II. (Meets two hours weekly.) 1 s.h. MR. EFIRD

18. EARLY CHRISTIAN LIFE AND LITERATURE.—A basic study of the civilization in which Christianity began; the origin and development of the Christian Church and its literature through the second century. 3 s.h. MR. SMITH

19. INTRODUCTION TO NEW TESTAMENT THEOLOGY.—A constructive analysis and exposition of the positive doctrinal content of the New Testament. Prerequisite: N.T. 18. 3 s.h. MR. ANDERSON

103-104. HELLENISTIC GREEK.—Designed for beginners to enable them to read the Greek New Testament. 6 s.h. (Two sections) STAFF

105. STUDIES IN PAUL.—An investigation of Paul's apostolate based upon the Acts and the Epistles with attention to Paul's theology as reflected in selected passages. 3 s.h. MR. EFIRD

116. EXEGESIS OF THE ENGLISH NEW TESTAMENT I.—A. Luke-Acts; B. Galatians and 1 Corinthians; C. The Pastoral Epistles. (N.T. 116 A, N.T. 116 B. and N.T. 116 C are separate courses, offered in different semesters.) 2 s.h. STAFF

117. EXEGESIS OF THE ENGLISH NEW TESTAMENT II.—A. The Gospel and Epistles of John; B. Romans. (N.T. 117 A and N.T. 117 B are separate courses, offered in different semesters.) 2 s.h. STAFF

118. THE NEW TESTAMENT IN GREEK.—Readings in the Gospels. 3 s.h. STAFF

119. THE NEW TESTAMENT IN GREEK.—Readings in the Epistles. 3 s.h. STAFF

* Course offered in the Graduate School of Arts and Sciences which is credited toward the degree of Bachelor of Divinity.

225. LIVING ISSUES IN NEW TESTAMENT THEOLOGY.—Examination of recent major questions of debate in the New Testament field. Prerequisite: N.T. 19. 3 s.h. Mr. Anderson

226. EXEGESIS OF THE GREEK NEW TESTAMENT I.—A. Mark and Matthew; B. Romans; C. Colossians and Ephesians. (N.T. 226 A, N.T. 226 B, and N.T. 226 C are separate courses, offered in different semesters.) Prerequisite: N.T. 103-104. 3 s.h. Mr. Price

227. EXEGESIS OF THE GREEK NEW TESTAMENT II.—A. Luke-Acts; B. Galatians and I Corinthians; C. The Pastoral Epistles; D. The Apocalypse. (N.T. 227 A, N.T. 227 B, N.T. 227 C, N.T. 227 D are separate courses, offered in different semesters.) Prerequisite: N.T. 103-104. 3 s.h. Mr. Anderson or Mr. Smith

318. TEXTUAL CRITICISM OF THE NEW TESTAMENT.—A study of the scientific recovery of the Greek text on which modern versions are based; manuscript discoveries; principles of textual criticism; practice in collating original manuscripts in the Duke collection. Prerequisite: N.T. 103-104, or the equivalent. 3 s.h. Mr. Clark

340-341. SEMINAR IN THE NEW TESTAMENT.—Research and discussion on a selected problem in the Biblical field. 2 s.h. Mr. Anderson and/or Mr. Smith

SEE ALSO Pr. 185 and O.T. 209.

*GREEK 257.—The social and cultural history of the Hellenistic world from Alexander to Augustus. 3 s.h. Mr. Rogers

*LATIN 258.—The social and cultural history of the Graeco-Roman world. 3 s.h. Mr. Rogers

II. Historical Studies

CHURCH HISTORY

13. HISTORY OF THE CHURCH TO THE PROTESTANT REFORMATION.—A survey through the fifteenth century in terms of spiritual genius, organizational development, great literature, and representative movements. 3 s.h. Mr. Petry

14. HISTORY OF MODERN EUROPEAN CHRISTIANITY.—A survey of the main currents in Reformation and post-Reformation church history. 3 s.h. Mr. Hillerbrand

85. SEMINAR IN MODERN EUROPEAN CHRISTIANITY.—A seminar devoted to the study of select aspects of Reformation and Post-Reformation Church History. This year the seminar will consider Reformation and Post-Reformation Confessions of faith. Prerequisite: C.H. 13-14. 2 s.h. Mr. Hillerbrand

137. RELIGIOUS LEADERS IN CHRISTIAN HISTORY.—Representative leaders in the early and medieval church studies in relation to contemporary churchmanship. Prerequisite: C.H. 13. 3 s.h. Mr. Petry

138. GREAT BOOKS IN CHRISTIAN HISTORY.—An intensive study of Augustine's *Confessions,* Thomas à Kempis' *Imitation of Christ,* Erasmus's *Complaint of Peace,* Luther's *Christian Liberty,* Calvin's *Instruction in Faith,* and Andrewes' *Private Devotions.* 3 s.h. Mr. Petry

139. METHODISM.—A study of Methodist societies in England and the developing church in America as they gave rise to such historic issues as polity, education, division, and reunion. Prerequisite: C.H. 13. 2 s.h. Mr. Petry

140. THE RISE OF METHODISM AND THE ANGLICAN BACKGROUND.—The Methodist societies within the Church of England to the death of Wesley. Prerequisite: C.H. 13-14. 3 s.h. Mr. Baker

(Students are advised that either C.H. 139 or C.H. 140 will satisfy the Methodist Discipline Requirement No. 344.)

142. BRITISH METHODISM AFTER WESLEY.—British Methodism in its nineteenth and twentieth century development. Prerequisite: C.H. 14. 3 s.h. Mr. Baker

* Course offered in the Graduate School of Arts and Sciences which is credited toward the degree of Bachelor of Divinity.

250. THE REFORMATION AND COUNTER REFORMATION.—History and thought of European Christianity between 1517-1680. 3 s.h. Prerequisite: C.H. 13, 14. MR. HILLERBRAND

251. PIETISM, DEISM, AND RATIONALISM.—History and thought of European Christianity between 1650 and 1750. 3 s.h. MR. HILLERBRAND

330. THE CHURCH IN EUROPE SINCE 1800.—Emphasis is placed on the relation of the church to the social, economic, and political life of Modern Europe. Particular attention is given to Papal pronouncements on social issues, the relationship of Eastern to Western institutions, and ecclesiastical historiography as it involves source editions, periodicals, and ecumenical literature. 3 s.h. MR. PETRY

331. THE SOCIAL MESSAGE OF THE EARLY AND MEDIEVAL CHURCH.—A study of the social teachings and contribution of the Christian church prior to the Protestant Reformation. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

332. THE MEDIEVAL CHURCH.—Outstanding characteristics of the medieval church, emphasizing theory, polity, institutions, sacraments, and worship. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

334. CHURCH REFORMERS AND CHRISTIAN UNITY.—The work of such reformers as Marsilius of Padua, William of Ockham, Jean Gerson, Pierre d'Ailly and Nicholas of Cusa in relation to ecclesiastical schism and the search for Christian unity through representative councils. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

336. CHRISTIAN MYSTICISM IN THE MIDDLE AGES.—Source studies, in historical perspective, of such late medieval mystics as Bernard of Clairvaux, the Victorines, Ramon Lull, Meister Eckhart, Richard Rolle, Catherine of Siena, and Nicholas of Cusa. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

339. LEFT WING MOVEMENTS OF THE REFORMATION.—A survey of the history and theology of the "radical" Reformation. 2 s.h. MR. HILLERBRAND

HISTORICAL THEOLOGY

21. THE THEOLOGY OF THE PROTESTANT REFORMATION.—The Reformation of the 16th century and its outcome in the 17th and 18th centuries. 3 s.h. MR. GRISLIS

111. LITERATURE OF THE LATIN CHURCH.—Readings, in the Latin originals, of diverse kinds of writing produced by the Latin Church in various periods of its history. Prerequisite: Permission of instructor. 3 s.h. MR. STRUGNELL

120. FAITH AND HERESY IN DIALOGUE.—Studies in the origin and role of the Apostles' the Nicene and the Chalcedonian Creeds in their contemporary setting. 3 s.h. MR. GRISLIS

121. SACRAMENTS IN THE CHRISTIAN CHURCH.—Ecumenical studies in devotion and division: Baptism and the Lord's Supper. 3 s.h. MR. GRISLIS

123. THE THEOLOGY OF THE EARLY CHURCH.—An introduction to the history of doctrine from the 2nd to the 6th centuries. 3 s.h. MR. GRISLIS

129. CRITICS OF CHRISTIANITY.—A Survey of Anti-Christian Polemics from Celsus to Nietzsche. 2 s.h. MR. HILLERBRAND

234. THE THEOLOGY OF THOMAS AQUINAS.—A systematic interpretation of the thought of Aquinas, with a major emphasis on his specifically theological formulations, drawing upon the *Summa Theologica* and other relevant sources. 3 s.h. MR. GRISLIS

240. THE THEOLOGY OF RICHARD HOOKER.—An exposition of the writings of the Systematic Theologian of Anglicanism in the sixteenth century. 3 s.h. MR. GRISLIS

260. SEMINAR: LIFE AND THOUGHT OF THE WESLEYS.—A seminar on John and Charles Wesley and their colleagues in relation to English culture and religion in the eighteenth century. Permission of instructor. 3 s.h. MR. BAKER

261. THE THEOLOGY OF JOHN WESLEY.—A study of the development and structure of Wesley's theology, with special reference to his doctrines of man and salvation. Prerequisite: Permission of instructor. 2 s.h. MR. RICHEY

337. THE THEOLOGY OF MARTIN LUTHER.—A critical and comparative examination of Luther's thought. 2 s.h. MR. HILLERBRAND

338. THE THEOLOGY OF JOHN CALVIN.—An exposition of the *Institutes of the Christian Religion* in relation to cognate documents. Prerequisite: H.T. 21. 3 s.h. MR. GRISLIS

AMERICAN CHRISTIANITY

28. HISTORY OF AMERICAN CHRISTIANITY.—A consideration of the nature of Christianity in America and the history of its development. 3 s.h. MR. HENRY

199. THE AMERICAN SOCIAL GOSPEL.—A study of Protestant social thought and action in America since 1865. 3 s.h. MR. NORMENT

296. RELIGION ON THE AMERICAN FRONTIER.—A study of the spread of evangelical Christianity as a theological and cultural phenomenon of the American West. Prerequisite: A.C. 28. 3 s.h. MR. HENRY

372. THEOLOGY OF PAUL TILLICH.—An examination of Tillich's philosophical theology. 2 s.h. MR. ROBINSON

385. RELIGION IN AMERICAN LITERATURE.—A critical study of the meaning and value of religious motifs reflected in American literature. 3 s.h. MR. HENRY

395. CHRISTIAN THOUGHT IN COLONIAL AMERICA.—Exposition of the main currents in Protestant Theology. 3 s.h. MR. HENRY

396. LIBERAL TRADITIONS IN AMERICAN THEOLOGY.—A study of the main types of modern religious thought, beginning with the theology of the Enlightenment. 3 s.h. MR. HENRY

397. CONTEMPORARY AMERICAN THEOLOGY.—A critical appraisal of major tendencies. 3 s.h. MR. HENRY

WORLD CHRISTIANITY

24. PHILOSOPHY OF THE CHRISTIAN WORLD MISSION.—A study of theological foundations, guiding principles, and contemporary problems of the World Christian Community. 2 s.h. MR. LACY

133. HISTORY OF CHRISTIAN MISSIONS.—A survey of the spread of Christianity with special emphasis on 19th and 20th century Protestantism. 2 s.h. MR. LACY

135. AREA STUDIES OF THE CHRISTIAN CHURCH.—The cultural setting and current programs and policies of the Church in one of the following areas: a. Latin America, b. India and Pakistan, c. Africa, d. Southeast Asia, e. Japan-Korea-Philippines, f. Moslem Lands, or g. United States Home Missions. (The area of study to be determined by student interest in consultation with the instructor.) 2 s.h. MR. LACY AND OTHERS

156. THE ECUMENICAL MOVEMENT.—Its contemporary development, structures, activities—and problems, against the background of Church unity and disunity. 3 s.h. MR. LACY

386. SEMINAR: THEOLOGICAL TRENDS IN THE WORLD CHURCH.—Contemporary currents of Christian thought as they affect the resurgent non-Christian faiths, new formulations of a theology of mission, and ecumenical conversations. 3 s.h. MR. LACY

SEE ALSO: C.Ed. 126, C.E. 190, C.E. 292, and C.E. 333.

HISTORY OF RELIGIONS

158. CONTEMPORARY NON-CHRISTIAN RELIGIONS.—Critical consideration of contemporary conditions in major non-Christian traditions, with special reference to Hinduism, Buddhism, Islam, and African Religions. 3 s.h. MR. SULLIVAN

180. RELIGIONS OF THE NEAR EAST.—Historical and theological introduction to the major indigenous traditions of the Near East, especially Zoroastrianism, and Islam. 3 s.h. MR. PARTIN

182. RELIGIONS OF INDIA.—Historical and theological introduction to Indian religious life and thought. The development of Buddhism is covered, as well as Jainism and Sikhism, along with the various modes of Hinduism. 3 s.h.
MR. SULLIVAN

279. RELIGIONS OF EAST ASIA.—A study of the major traditions of China and Japan with emphasis on the development and expansion of Buddhism. 3 units.
MR. SULLIVAN

280. THE HISTORY OF RELIGIONS.—A study of the methodology of the History of Religions, the nature of religious experience and specific categories of religious phenomena. Permission of instructor. 3 s.h. MR. SULLIVAN

III. Theological Studies

PHILOSOPHY OF RELIGION

20. TYPES OF RELIGIOUS PHILOSOPHY.—Basic historical orientation in religious thought, especially in Western Culture. 3 s.h. MR. ROBINSON

102. CHRISTIAN APOLOGETICS AND MODERN WORLD VIEWS.—A constructive approach to the Hebrew-Christian understanding of Creator and creature in the light of contemporary scientific knowledge. 3 s.h. MR. ROBINSON

CHRISTIAN THEOLOGY

32. CHRISTIAN THEOLOGY I.—A constructive statement of the themes of systematic theology as a task of the church today: theological method, knowledge of God, man, and Christ. 3 s.h. MR. CUSHMAN AND MR. HALL

33. CHRISTIAN THEOLOGY II.—God the redeemer, the church, word and sacraments, authority and ministry, the Kingdom of God. 3 s.h. MR. HERZOG

108. REVELATION AND AUTHORITY.—A study of the relationship between revelation, Bible, preaching and the church. 3 s.h. MR. HERZOG

110. THIS LIFE AND THE AGE TO COME.—Christian eschatology and the meaning of history in the light of God's triumph over sin, suffering, and death. 3 s.h. MR. ROBINSON

*125. THEOLOGICAL AND PSYCHOLOGICAL INTERPRETATIONS OF MAN.—An inquiry into the relations of theological and psychological views of man's nature, predicament, and deliverance. 3 s.h. MR. RICHEY

195. ORIGINS OF DOGMATIC THOUGHT.—An analysis of dogmatic concepts in the Gospel of John: their development into a body of doctrine. 3 s.h.
MR. HERZOG

200. THE PERSON AND WORK OF CHRIST.—The problem of knowledge of Christ and formulation of a doctrine of his work and person in the light of Biblical eschatology. Prerequisite: C.T. 32-33. 3 s.h. MR. CUSHMAN OR MR. HALL

213. THE STRUCTURE OF ROMAN CATHOLIC THOUGHT.—The main characteristics of Roman Catholic theology with consideration of possibilities and limitations in ecumenical conversation with Rome. Prerequisites: C.H. 13 and 14 and H.T. 21. 3 s.h. MR. HERZOG

216. KIERKEGAARD STUDIES.—Critical examination of selected works. Prerequisite: C.T. 32 or permission of the instructor. 3 s.h. MR. ROBINSON

224. CONCEPTIONS OF MAN IN WESTERN THOUGHT.—An analysis and interpretation of important types of philosophical and theological theory. 3 s.h.
MR. RICHEY

303. DOGMA AND THE PROBLEM OF HISTORY.—The authority of Kerygma and the Word of God in twentieth-century European theology. 3 s.h. MR. HERZOG

320. SEMINAR: FRIEDRICH SCHLEIERMACHER.—Critical examination of the dogmatic system. Prerequisite: C.T. 322. 3 s.h. MR. HERZOG

* May be taken and grade recorded as Christian Educ. 125.

322. NINETEENTH CENTURY EUROPEAN THEOLOGY.—Protestant theology from Kant to Herrmann. 3 s.h. Mr. Herzog

323. SEMINAR: BULTMANN.—Critical examination of representative works, with some consideration of relation to the work of Martin Heidegger. Prerequisite: C.T. 32-33 or permission of the instructor. 3 s.h. Mr. Robinson

325. PHILOSOPHICAL THEOLOGY I.—Main problems in the history of philosophical theology from the pre-Socratics to Descartes. Prerequisite: C.T. 32-33. 3 s.h. Mr. Robinson

326. PHILOSOPHICAL THEOLOGY II.—Main problems of philosophical theology in the modern period. Prerequisite: C.T. 325. 3 s.h. Mr. Robinson

328. SEMINAR IN TWENTIETH CENTURY EUROPEAN THEOLOGY.—Critical examination of the thought of selected representative theologians. Prerequisite: C.T. 32-33 and permission of instructor. 3 s.h. Mr. Herzog

CHRISTIANITY AND CULTURE

16. CONTEMPORARY WESTERN CULTURE.—An analysis of the conceptual commitments in contemporary styles of thought and life as reflected in the natural sciences, philosophy, social analysis, and the arts. 3 s.h. Mr. Poteat

80. THE CHRISTIAN FAITH AND TRAGEDY.—An exploration of the tragic view of life as exhibited in selected classic and contemporary works of literature and a comparison of this with Christian belief. 3 s.h. Mr. Poteat

81. RECENT AND CONTEMPORARY ART AND THEOLOGY.—The study of 19th and 20th century painting and sculpture as documents of contemporary man's apprehension of himself and his world; and as elements in the conversation between Christian faith and culture. 3 s.h. Mr. Poteat

230. THE MEANING OF RELIGIOUS LANGUAGE.—An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. Prerequisite: C.T. 32-33 or permission of instructor, 3 s.h. Mr. Poteat

231. SEMINAR IN CHRISTIANITY AND CONTEMPORARY THOUGHT.—Analytical reading and discussion of such critical cultural analysis as is found in the works of M. Polanyi, Arendt, Trilling, and others, with appraisal of the relevance for theological inquiry. Prerequisite: C.T. 32-33 or permission of instructor. 3 s.h. Mr. Poteat

380. EXISTENTIALIST THOUGHT.—An analysis of writings of representative thinkers from Kierkegaard to Sartre. Prerequisite: C.T. 32-33, or permission of instructor. 3 s.h. Mr. Poteat

CHRISTIAN ETHICS

27. CHRISTIAN ETHICS I.—The central assumptions and principles of the Christian conception of the good life. 3 s.h. Mr. Beach

114. CHRISTIAN SOCIAL ETHICS.—The principles of Christian social policy with reference to domestic, social, political, and economic patterns of contemporary culture. Mr. Smith

115. CHRISTIAN SOCIAL ACTION IN THE LOCAL CHURCH.—Christian ethical principles, resources, procedures, and programs for pastoral leadership in parish social action. 2 s.h. Mr. Smith

122. MORAL THEOLOGY IN THE NINETEENTH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of representative theologians. 3 s.h. Mr. Smith

124. MORAL THEOLOGY IN THE TWENTIETH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of William Temple and selected contemporary theologians. 3 s.h. Mr. Smith

190. THE CHRISTIAN CRITIQUE OF COMMUNISM.—Analysis of and alternatives to the dynamic secular ideology from a religious standpoint. 3 s.h. Mr. Lacy

194. THE PROTESTANT CHURCH AND AMERICAN CULTURE.—Analysis from the perspective of Christian ethics of current problems in the interpenetration of Church and culture with explicit reference to the parish setting. 3 s.h. MR. SMITH

292. CHRISTIAN ETHICS AND INTERNATIONAL RELATIONS.—An examination of Christian attitudes toward such issues as war and peace, the rule of law, foreign aid, and human rights; and the Church's contribution to international policies and institutions. 3 s.h. MR. LACY

333. SEMINAR: MARXIST IDEOLOGY AND CHRISTIAN FAITH.—Comparative study of Communist and Christian doctrines of man, society, sin, history, ethics, and eschatology. Prerequisite: C.E. 190 or equivalent. 3 s.h. MR. LACY

389. CHRISTIAN ETHICS AND CONTEMPORARY CULTURE.—A study of the interaction between Christian thought and current secular social theory. Prerequisite: C.E. 27 or its equivalent. 3 s.h. MR. BEACH

390. CURRENT PROBLEMS IN CHRISTIAN ETHICAL THEORY.—A critical study, seminar style, of dominant issues in Christian Ethics, through an analysis of a variety of contemporary Christian treatments of such problems as love, justice, community and vocation. Prerequisite: C.E. 27 or its equivalent. 3 s.h. MR. BEACH

391. HISTORICAL TYPES OF CHRISTIAN ETHICS I.—A critical study of representative statements of Christian ethical theory, through the early Reformation. Prerequisite: C.E. 27 or its equivalent. 3 s.h. MR. BEACH

392. HISTORICAL TYPES OF CHRISTIAN ETHICS II.—A continuation of C.E. 391, from the Reformation through current Christian ethical theory. Prerequisite: C.E. 391. 3 s.h. MR. BEACH

393. THE CHRISTIAN INTERPRETATION OF HISTORY.—A comparative examination of the chief secular and Christian theories of history current in Western thought. For advanced students. Prerequisite: C.E. 27. 3 s.h. MR. BEACH

394. CHRISTIANITY AND THE STATE.—The relation of the Christian theory of the State to political problems with special consideration of the religious assumptions underlying democratic theory and practice, and of the relationship of Church to State. Prerequisite: C.E. 27. 3 s.h. MR. BEACH

IV. Professional Studies

THE CARE OF THE PARISH

10. THE CHURCH AND THE MINISTER'S VOCATION.—An orientation course for beginning students, devoted to a consideration of the nature of the Church and the tasks of the ministry. 1 s.h. STAFF

23. THE CARE OF THE PARISH.—A consideration of the pastor's function as leader of the Christian community. 3 s.h. MR. INGRAM AND OTHERS

146. CHURCH BUILDING.—The role of the pastor in planning and executing building programs in the local church: architectural considerations and counsel, building requirements and plans. 2 s.h. MR. NESBITT

148. CHRISTIAN STEWARDSHIP AND CHURCH FINANCE.—A seminar to consider the principles of stewardship education, budget making, enlistment in church support. 2 s.h. MR. INGRAM AND MR. KALE

150. RURAL CHURCH AND COMMUNITY.—The structure and dynamic factors shaping the present-day rural community together with their import for the work of the Church. 2 s.h. MR. SCHORES

151. THE TOWN AND COUNTRY CHURCH.—The small church, the circuit church, circuit administration, larger parish and group ministry, and the Town and Country movement. 2 s.h. MR. NESBITT

152. EVANGELISM AND THE LOCAL CHURCH.—A study of the nature, purposes and methods of contemporary Christian evangelism with special attention to the local church. 2 s.h. MR. KALE AND MR. INGRAM

153. PASTORAL LEADERSHIP IN THE LOCAL CHURCH.—A study of the pastor's role in determining the objectives and program of the local church with attention to planning for the church year. 2 s.h. Mr. Ingram

154. THE URBAN CHURCH.—The function, nature, program, and administration of the effective city church and of the urban minister's distinctive task. 2 s.h. Mr. Ingram

155a. THE POLITY OF THE METHODIST CHURCH.—The history and present structure of the organization of The Methodist Church. 2 s.h. Mr. Ingram

155b. THE POLITY OF THE BAPTIST CHURCHES.

155c. THE POLITY OF THE CONGREGATIONAL-CHRISTIAN CHURCHES.

155d. THE POLITY OF THE PRESBYTERIAN CHURCHES. Staff

157. RESEARCH AND SURVEY FOR THE PARISH MINISTER.—An introduction to basic forms of sociological research as applied to the local church: self-evaluations, religious census, opinion polls, community surveys, use of secular resources and agencies. Field and laboratory methods will be explored through involvement in a research project. 2 s.h. Mr. Schores

FIELD WORK PRACTICUM I.—Discussion of various aspects of parish work with opportunity for students to seek guidance respecting procedures and problems. Designed especially for students with parish responsibilities. (Fall Semester. Sections arranged.) 1 s.h. Mr. Schores and Others

FIELD WORK PRACTICUM II.—Required of students expecting summer assignments under the Endowment and Field Work Program. Types of parish service to be discussed. (Spring Semester) 1 s.h. Mr. Schores and Others

CHRISTIAN EDUCATION

22. THEOLOGY AND CHRISTIAN NURTURE.—The implications of theology and educational philosophy for the theory and practice of Christian education. 3 s.h. Mr. Richey

25. THE CHURCH AND CHRISTIAN NURTURE.—A constructive survey of the local church as a community of Christian nurture: Statement and evaluation of objectives, leadership and resource materials, structural patterns and administrative and supervisory procedures for the church school. 2 s.h. Mr. Kale

125. THEOLOGICAL AND PSYCHOLOGICAL INTERPRETATIONS OF MAN.—(See C.T. 125)

126. MISSIONARY EDUCATION IN THE LOCAL CHURCH.—Practical programs for church school, audio-visual aids, preaching, stewardship, and special projects. 2 s.h. Mr. Lacy and Others

129. RELIGION AND PERSONALITY.—Investigation of religious aspects of the origins, structure, and development of selfhood. 3 s.h. Mr. Richey

149. THE MINISTRY TO THE CAMPUS.—An examination of the circumstances which have produced, and the unique problems which confront, the ministry on the campus, considered from the perspective of the Christian idea of higher education. 3 s.h. Staff

161. TEACHING METHODS.—Basic teaching procedures required by professional and lay workers in the local church. Opportunities are arranged for observation and guided practice in church schools, and/or other institutions. Required for candidates for the M.R.E. degree. 3 s.h. Mr. Kale

162. CURRICULUM BUILDING IN THE LOCAL CHURCH.—An examination of influential theories of and contemporary trends in curriculum construction, together with an evaluation of existing curricula. Actual designing of short units for use in the local church. 3 s.h. Mr. Kale

164. CHRISTIAN EDUCATION OF CHILDREN.—The organization and administration of the work of the church with children of the nursery, kindergarten, primary and junior age groups. 2 s.h. Mr. Kale

165. CHRISTIAN EDUCATION OF YOUTH.—The organization and administration of the youth program in the local church. 2 s.h. Mr. Kale

166. CHRISTIAN EDUCATION OF ADULTS.—A study of the needs of adults; the materials, methods, and principles of organization for the Christian education of adults. 2 s.h. MR. KALE

167. THEOLOGY AND THE LAITY.—A study of contemporary lay movements and centers, the ministry and mission of the laity in Church and world, and the ministry of teaching in the lay renewal of the Church. (For Middlers and Seniors.) 3 s.h. MR. RICHEY

169. THEORIES OF CHRISTIAN EDUCATION.—A critical investigation of current theories of Christian education. 2 s.h. MR. RICHEY

CHRISTIAN EDUCATION PRACTICUM.—Required of M.R.E. candidates. One class per week and supervised project. 3 s.h. MR. KALE AND OTHERS

PASTORAL CARE

26. INTRODUCTION TO PASTORAL CARE.—The psychology of personal adjustment and pastoral care. An approach to pastoral care and its place in the pastor's total ministry grounded in an understanding of the dynamics of personal adjustment. 3 s.h. MR. GOODLING

170. INTRODUCTION TO PASTORAL COUNSELING.—The philosophy and techniques of formal counseling through discussions of textual and interview material. Prerequisite: P.C. 26. 3 s.h. MR. GOODLING

171. PASTORAL CARE PRACTICUM I.—Pastoral Calls and Personal Counseling. A study of pastoral calling and personal counseling in the parish ministry. Prerequisites: P.C. 26 and 170. 2 s.h. STAFF

172. PASTORAL CARE PRACTICUM II.—Marriage and the Family. A consideration of pre-marital and marital counseling and the psychodynamics of family life. Prerequisites: P.C. 26 and 170. 2 s.h. MR. GOODLING

173. PASTORAL CARE PRACTICUM III.—The Chaplain in a Rehabilitation Program. The ministry to those in alcoholic and correctional institutions. Prerequisites: P.C. 26 and 170. 2 s.h. STAFF

174. THE CHURCH AND MENTAL HEALTH.—The meaning of the self and the resources of the church in doctrine and worship in self-fulfillment. 2 s.h.

175. ADVANCED PASTORAL CARE PRACTICUM.—For advanced students who want additional clinical experience in one of the Pastoral Care Practicum areas. Consent of the instructor is required. Students may register for from 1 to 5 s.h. clinic credit. STAFF

176. PASTORAL CARE PRACTICUM IV.—The Psychiatric Setting. Lectures by staff and ward visits at the Dorothea Dix Hospital in Raleigh. The place of the minister in a program dealing with the causes, treatment, and prevention of mental illness. Prerequisites: P.C. 26 and 170. 3 s.h. MR. STEININGER

177. PASTORAL CARE PRACTICUM V.—The Hospital Ministry. Pastoral care and counseling with the ill, the dying, bereaved. Prerequisites: P.C. 26 and 170. 2 s.h. and 1 s.h. clinic. MR. GOODLING

188. SCIENCE, FAITH AND PSYCHOANALYSIS.—An analysis of the fundamental categories of the Christian message and psychoanalysis. An exploration into the objectives and the methods of science and the meaning of religion. 3 s.h.

271. CLINICAL PASTORAL TRAINING I.—Out-Patient Counseling under psychiatric supervision. 4 s.h. STAFF

273. CLINICAL PASTORAL TRAINING II.—The Chaplain in a Rehabilitation program. Twenty hours of supervised clinical training weekly in a rehabilitation institution. 4 s.h. STAFF

276. CLINICAL PASTORAL TRAINING III.—The Chaplain in a Psychiatric Setting: the mental hospital.

276A. Full-time 12-week summer quarter. 6 s.h.

276B. Twenty hours per week, fall semester. 4 s.h.

276C. Twenty hours per week, spring semester. 4 s.h. STAFF

277. CLINICAL PASTORAL TRAINING IV.—The Chaplain in the General Hospital setting.

277A. Full-time 12-week summer quarter. 6 s.h.

277B. Twenty hours per week, fall semester. 4 s.h.

277C. Twenty hours per week, spring semester. 4 s.h. STAFF

THE CHURCH AT WORSHIP

34. WORKSHOP IN COMMUNICATION.—Intensive drill in voice, diction, speaking and reading. Enrollment by recommendation of teaching faculty. 1 s.h. MR. RUDIN

PREACHING

29-30. SERMON CONSTRUCTION—THEORY AND PRACTICE.—An investigation of the theory of preaching (first semester). Detailed work in practice preaching and a clinical session each week on the application of theory (second semester). 3 s.h. MR. HALL AND OTHERS

31. ADVANCED SERMON PRACTICE.—A weekly session of clinical exercises in expository preaching and sermon evaluation for senior students of Vocational Group 1. Prerequisite: Pr. 29-30. 1 s.h. STAFF

181. PRACTICAL PROBLEMS IN PREACHING.—Analysis of selected sermons and discussion of problems facing the preacher in the pulpit. Prerequisite: Pr. 29. 2 s.h. MR. CLELAND AND MR. HALL

183. EXPOSITORY PREACHING—OLD TESTAMENT.—The exegesis and exposition of selected Old Testament passages for homiletical purposes. Prerequisite: Pr. 29. 2 s.h. MR. CLELAND

184. EXPOSITORY PREACHING—THE PAULINE EPISTLES.—A study for homiletical purposes of the religious experience and theology of Saint Paul and its influence on ethical theory and practice. Prerequisite: Pr. 29. 3 s.h. MR. CLELAND

185. EXPOSITORY PREACHING—NON-BIBLICAL.—An evaluation of drama, poetry and fiction for homiletical purposes. Prerequisite: Pr. 29. 3 s.h. MR. CLELAND

187. PRE-REFORMATION PREACHING.—Sermons, handbooks, and other historical sources studied in relation to Biblical preaching and the liturgical church, the problem of popular ministry and the issues of Christian reform. Prerequisite: C.H. 13. 2 s.h. MR. PETRY

193. THEOLOGY AND PREACHING.—An examination of the relation of systematic theology and homiletical presentation in the sermons of major Christian leaders, past and present. 3 s.h. MR. HALL

WORSHIP AND CHURCH MUSIC

40. THE CHURCH AT WORSHIP.—The structure of worship, the rites of the church, its music, and the conduct of worship in the context of the Christian year. 3 s.h. MESSRS. CLELAND, HANKS AND RUDIN

134. LITURGICAL READING.—Practice in reading the liturgical materials of the pastoral ministry: Scriptures, prayers, and the rites and seasonal services in the Methodist *Book of Worship*. 2 s.h. MR. RUDIN

141. THE CLASSIC AGE OF THE ENGLISH HYMN.—Eighteenth century development of the English hymn with special reference to Watts and the Wesleys, their precursors and successors. 2 s.h. MR. BAKER

178. CORPORATE WORSHIP.—The theory and practice of the common worship of the Church, using various manuals of worship. One hour to be arranged. 2 s.h. MR. RUDIN

180. CHURCH MUSIC.—A two-fold study including: (1) A survey of the great monuments of church music, (2) Musicianship, songleading and basic conducting; with an emphasis upon the use of the hymn tunes and other music in the Methodist hymnal. 3 s.h. MR. HANKS

CHAPEL CHOIR.—Students who successfully complete C.W. 40 or C.W. 180 before graduation may qualify for credit (to the limit of 2 s.h.) of ½ s.h. for each semester of effective participation in the Chapel Choir. Choir membership (granted by audition) affords opportunity for study of the history and background of church music, and practical consideration of it in the context of public worship.

Student Expenses and Residential Arrangements

FEES AND COSTS

THERE is an admission fee of $30. which is applied to the first-term bill. (See statement of requirements for admission for full details).

Items	*Per Semester*
Tuition	$262.50
General Fee	56.50
Approximate cost of meals (estimated)	275.00
Room (double) for men	125.00
Total	$719.00

The General Fee is in lieu of all special charges, and includes the following fees: Matriculation, Medical, Library, Damage, Commencement, and Diploma. Both the Tuition and General Fee are due and payable not later than the day of registration for a particular semester.

A student who is a candidate for a degree (B.D., M.R.E., or Th.M.) shall be liable for the Tuition and the General Fee for the number of semesters required to complete the degree under a normal load of 15 semester hours. The B.D. candidate will pay tuition for six (6) semesters, the M.R.E., four (4) semesters, and the Th.M., two (2) semesters. If extra semesters are required to complete the degree, there will be no tuition; however, the General Fee will be payable on a prorated basis.

Special Students are those who are enrolled but who are not candidates for a degree. Tuition and General Fee for these will be on a prorated basis.

Students matriculating in either semester at a date later than that prescribed in the catalogue shall pay to the Bursar of the University a penalty of $5.00. After the day of registration no refund of the General Fee or tuition will be made except for involuntary withdrawal to enter the Armed Services.

Divinity School Students may secure admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of the athletic fee of $15.00 per year, plus any Federal tax that may be imposed. This fee is payable in the fall semester.

Students who are reported by the Treasurer's Office as delinquent in their accounts will be debarred from credit in courses until cleared

by the Treasurer's Office. Transcripts will not be issued for delinquent students.

The total cost for a student to attend the Duke Divinity School varies according to individual tastes and requirements; however, experience indicates that a single student may expect to spend from $1800 up with the average approximately $2050, and a married couple may expect to spend from $3000 up.

The Board of Trustees of Duke University determines the costs of attending the Divinity School and these are subject to change without notice.

AUDITING OF COURSES

Persons seeking to audit Divinity School courses must, with the consent of the instructor concerned, secure permission of the Dean's office. In accordance with general University practice a fee of $15.00 per course will be required of all auditors who are not enrolled students.

STUDENT HEALTH

The payment of the general fee entitles the student who is taking at least 7 hours or more to full medical and surgical care, with the exceptions noted below. This service is under the direction of the University Physician with the co-operation of the staff of Duke Hospital. It includes hospitalization, medical and surgical care, drugs, dressings, X-ray studies, and ward nursing. A charge for board is made at the same rate as in the University dining halls. Refraction of eyes, treatment of teeth and of all chronic conditions, such as the removal of diseased tonsils, are not included in this service. The cost of any necessary braces and orthopedic appliances, as well as of special nursing, must be borne by the student.

Since the Student Health Program does not cover students while away from the Duke Campus, it is imperative that student pastors and assistant pastors (winter and/or summer) who are subjected to the hazards of highway travel with great frequency, secure complementary health and accident insurance for the full 12 month period.

Information concerning such a policy may be secured by inquiring at the office of the Dean of Students. Such a complementary policy is recommended for all students.

Married students are required to carry insurance coverage for their dependents, providing for hospital, medical and surgical care.

LIVING ACCOMMODATIONS

The Men's Graduate Center is available to men enrolled in the Divinity School. The rooms are equipped for two persons and the rental charge for a double room is $125.00 each semester per occupant.

Epworth Hall on the Woman's College Campus is available to women enrolled in the Divinity School. The rental charge for a double room is $137.50 per semester for each occupant.

The rental charge for a single room is higher.

Duke University Apartments, which consist of efficiency, one- and two-bedroom apartments, are available to married graduate students. The apartments are complete with basic furnishings and the current rental charges per month are $70.00 for the efficiency, $80.00 for the one-bedroom, and $90.00 for the two-bedroom. Heat, electricity, except for window fans and air conditioners, hot and cold water, garbage and trash collection, and maintenance of grounds are all included in the rental charge. For further information on married student apartments, write to the Housing Bureau, Duke Station, Durham, North Carolina.

Residence hall rooms and Duke University Apartments may be reserved by new applicants only if they have been accepted officially for admission to the Divinity School. Applications for residence hall rooms are to be made to the Housing Bureau, Duke Station, Durham, North Carolina. A $25.00 room deposit is required of each applicant before a residence hall room reservation is made. The initial room deposit is effective during the student's residence in the University residence halls if attendance is continuous in regular academic years. The deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated provided written notice is received at the Housing Bureau requesting refund.

b. Upon withdrawal from Duke University Residence Halls by students enrolled on the semester basis, provided written notice is received in the Housing Bureau by August 1st for cancellation of a reservation for the fall semester, and not later than January 15th for cancellation of a reservation for the spring semester.

c. When the reasons requiring withdrawal are beyond the student's control.

No refund will be made until the occupant has checked out of his room through the Housing Bureau and has settled his account with the Bursar.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of the reservation.

The authorities of the University do not assume responsibility for persons selected as roommates. Each student is urged to select his roommate when the room is reserved. Any student who occupies a double room without a roommate will be given written notice from

the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room.

Any exchange of rooms must be made at the Housing Bureau. Persons exchanging rooms without the approval of the Housing Bureau will be subject to the charges for both rooms.

Rooms are rented for the academic year but for no period of less than one semester without special arrangements. After the day of registration, no refund of room rent will be made except for involuntary withdrawal to enter the Armed Services. Such refunds will be made in accordance with the University's established schedule. Regulations governing the occupancy of rooms will be supplied by the Housing Bureau to those students who make application for housing. Occupants are expected to abide by these regulations.

DINING HALLS

Food service on both the Woman's College Campus and the West Campus is cafeteria style. The cost of meals approximates $250.00-$300.00 per semester depending upon the need and taste of the individual. The dining facilities on the West Campus include three cafeterias with multiple choice menus and, in addition, the Oak Room, where full meals and a la carte items are served. The Men's Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 P.M. The prices are the same as in the West Campus Union.

MOTOR VEHICLES

Each motor vehicle operated on the campuses by students enrolled in the Divinity School must be registered at 016 Social Science Building within 5 days after arrival, and thereafter must display the proper registration emblem. To register a vehicle the student must present the following documents:

1. State vehicle registration.
2. State operator's license.
3. Evidence of automobile liability insurance as required by North Carolina law: $5,000 per person and $10,000 per accident for personal injuries; and $5,000 property damage.

An annual car registration fee of $30.00 is required of unmarried students resident in dormitories.

Parking, Traffic, and Safety Regulations will be given each student registering his vehicle. Students are expected to abide by these regulations.

Statement on Financial Aid

IT IS proper that a student should select his school on the basis of educational opportunity. At the same time financial consideration will be of legitimate and often pressing concern. Each student should formulate at least a tentative plan for financing his seminary education. Such a plan would not of necessity demand absolute assurance of all necessary educational expense, but should include specific resources for the first year and a knowledge of probable resources for the second and third years.

The Committee on Scholarships and Financial Aid of the Duke Divinity School will gladly counsel with the student concerning possible resources. It is the expressed goal of the Committee to assist the student to secure all needed financial assistance so that upon graduation the student will have a minimum of indebtedness.

Remembering that there are no unlimited resources, it is therefore imperative that the seminary, the church, and the student practice the principles of Christian stewardship in the use of funds for theological education. This entails an appreciative knowledge of the sources, an understanding of the conditions under which financial assistance can be made available, and the wise and unselfish use of these funds.

The primary purpose of a financial aid program is to provide assistance, within limits, to students who demonstrate financial need. Financial need is defined as the difference between the total cost of attending a particular institution and the amount of resources available to the student. Financial assistance may consist of scholarships, loans, tuition grants, grants-in-aid, and employment which may be worked out in various combinations on a year-to-year basis, with reapplication and review each year.

Students are expected to be able to finance themselves for the first semester of work in the Divinity School. Those who show that they can carry their school work satisfactorily and who demonstrate need are then eligible to apply for various forms of financial assistance as described under III and IV. Financial resources may be any or all of the following:

I. PERSONAL. In order that both the Church and the Divinity School may be able to extend the use of their limited funds to as many students as possible, a student who is desirous of a theological education should be willing to provide insofar as possible for the cost of such education from his own resources. These may

be savings and earnings, gifts from family and friends, and, if married, earnings of spouse and gifts from parents of spouse. In calculating anticipated income, the student first considers his own resources.

Students, who have completed their undergraduate education and/or who have worked several years, prefer to be independent of parental support. This is an admirable trait and should be encouraged. However, if parents are in a financial position to assist, there should be arranged a "man to man" business relationship rather than a "father-son" dependency relationship. The student is now entering upon a calling in which he gives himself, his time, his talent for the cause of Christendom. Others will, of necessity, have to assist in financing the student's seminary education. Therefore, the parents can join with the Church and the School in providing the necessary resources during seminary days.

A married student must calculate his expenses accordingly. In the case of a married student with no children, the spouse is expected to be gainfully employed. The spouse's total earnings are to be considered as part of the total family income.

II. CHURCH. Many local churches and conferences provide gifts and grants for theological education.

In recent years many Methodist Annual Conferences, as well as other denominations, have established Ministerial Training Funds for the purpose of providing grants and/or loans to theological students to help defray the costs of tuition, fees, and other educational expenses. The student makes application to his own church, Annual Conference, Presbytery, or other.

III. THE DIVINIY SCHOOL

A. Scholarships

1. Junior Merit Scholarships. To encourage qualified students of superior promise to pursue their preparation for the Christian ministry a limited number of merit scholarships are available each year for entering B.D. students. These scholarships provide an amount covering full tuition plus up to $700. Merit scholars are accorded priority in the selection of students for the Summer Endowment and Field Education Program.
2. National Methodist Scholarships. Two National Methodist Scholarships, having a cash value of $500 each are made available annually by the General Board of Education of The Methodist Church to two outstanding students in the first year class. Awards are granted by the General Board of Education upon the recommendation of the faculty.

Students receiving these awards are required to participate in a two-weeks' expense paid travel seminar during which they visit and study all of the boards and agencies of The Methodist Church located in Nashville, Chicago, New York City, Washington, and Philadelphia.

3. Middler Academic Scholarships. Each year two men are selected to receive Middler Academic Scholarships in the amount of $500. These awards are based on academic excellence and leadership potential.
4. Senior Honor Scholarships. Each year a limited number of honor scholarships are awarded to rising seniors who have achieved academic excellence and who give unusual promise of service in the pastoral ministry.
5. Foreign Student Scholarships. In cooperation with the Crusade Scholarship Committee of The Methodist Church and other authorized church agencies students are selected and are admitted to courses of study. Scholarships for such students are provided from the Lewis Clarence Kerner Scholarship Fund and from individual Methodist Churches and friends.

B. Tuition Grants. These in varying amounts, commensurate with need, are available upon application to the Committee on Scholarships and Financial Aid. Currently enrolled students who are eligible for consideration must apply in November or December prior to the academic year for which a tuition grant is requested. Entering students may apply when admitted. Those whose applications are received prior to February 1 should receive notice of the Committee's action not later than February 20. Those whose applications are received after February 1 will be notified as rapidly as their cases can be reviewed. All applicants should understand that tuition grants will vary in amount and are subject to review either at the initiative of the student or that of the Committee on Scholarships and Financial Aid.

C. Grants-in-aid. A Grant-in-Aid is made available through the Divinity School to a student who chooses to make participation in the Endowment and Field Education Program an integral part of his seminary training. The grant is made for the express purpose of defraying educational expenses. The student must evidence a sincere desire to: (1) Make the required preparation. (2) Make the experience one of learning and self improvement as well as service, under the guidance of the Committee on Endowment and Field Education, the pastor, and the faculty supervisor.

The primary source of Grants-in-Aid is the Duke Endowment, which has as one of its beneficiaries the *rural* Methodist Churches of the two North Carolina Methodist Conferences.

The overall program has been expanded through the use of limited funds (other than Duke Endowment) to include urban and out-of-state churches. The Duke Endowment funds provide the *only* source of Grant-in-Aid for Student Pastors. The Grant-in-Aid program includes the following:

1. Summer Assistant Pastors: Students may apply during the fall semester (November) requesting approval to participate in the Summer Endowment and Field Education Program as Assistant Pastors. Upon request of churches, students are assigned to serve 10 weeks (or five, by special agreement) and in return they receive their room and board for the period of service and grants-in-aid up to $800. Married students whose wives work must be prepared to go without their wives. A limited number of entering students can be assigned; however, prior consideration is given to rising Middler and Senior students. Students transferring to another seminary are not eligible for assignment the summer prior to transfer.

   Address correspondence to: Endowment and Field Education Committee, Box 4814, Duke Station, Durham, N.C.
2. Winter Assistant Pastors: Any student who is not serving as a student pastor, may be assigned to serve as a part-time assistant in a local church or related agency during the period of the regular academic year, September through May. Applications for such assignments must be made to the Endowment and Field Education Committee at least thirty days in advance of the opening of the autumn semester each year. Students assigned to these positions agree to engage in a specified number of hours of field service each week and in turn they receive grants-in-aid in varying amounts. Assistant pastors and those doing special work are expected to keep their daily travel as low as possible. (Note additional statement in Section on Field Education.)
3. Student Pastors: The Divinity School does not appoint pastors to churches but serves as the liaison agency between the church and the student. The Director of Field Education, or his representative, advises with students regarding opportunities for pastorates and in turn offers information and recommendations to church officials regarding students who are eligible to be assigned to pastorates. No student can

serve as a student pastor without the written approval of the Director of Field Education. Salaries and other forms of support are arranged by church officials in keeping with denominational policies and are reported to the Divinity School.

Student Pastors may be enrolled for not less than eight or more than 12 hours of academic work in any given semester. (See page 36.)

If the charge being served is located beyond 50 to 55 miles from the campus, the students are required to live in Durham or vicinity during the academic work week, Monday 2 P.M. through Friday, 4 P.M. Correspondence concerning a student pastorate should be addressed to: Director of Field Education, Box 4353, Duke Station, Durham, N.C.

IV. Loans: Loan Funds held in trust by the University, as well as Methodist Student Loans and funds supplied by the Federal Government through the National Defense Education Act of 1958, are available to qualified students.

Loans generally mature after the borrowers have left the University. Loan interest on long term loans from University funds accrues at the rate of 1% from the date of each note. After a student has left the University permanently the loans begin bearing interest at the rate of 3% per annum. The balance unpaid after five years bears interest at the rate of 6% per annum.

Loan applications must be submitted not later than July 1 preceding the academic year for which assistance is requested and must be approved by the Committee on Scholarships and Financial Aid.

Note: Unless otherwise indicated all correspondence concerning financial aid should be directed to: Financial Aid Office, The Divinity School, Box 4814, Duke Station, Durham, N.C. All applications will be reviewed by and all financial aid approved by the Committee on Scholarships and Financial Aid.

V. Employment: There are a number of opportunities during the academic year for part-time non-church employment on the Duke Campus and in the City of Durham. Students or wives needing this type of employment must make their own arrangements with employers and must plan their work schedules so as not to be denied full participation in the educational and cultural opportunities of the Divinity School.

Students or wives desiring employment with the University should apply to the Director of Personnel, 01 Allen Bldg., Duke Station, Durham, North Carolina.

Field Education

ITS Nature and Purpose. Field Education is conceived to have a two-fold nature. (1) It is a vital part of the total education of the theological student, assisting him in understanding the nature and task of the church and in testing his motivation and fitness for the vocation of the ministry. (2) It is a symbol of a mutual relationship between the seminary and the local church, and it is an effective way of declaring and implementing the purpose of the seminary to serve the church as well as the student.

More specifically it is the purpose of Field Education to: (1) assist the student in understanding the nature and task of the local church; (2) study some of the practical problems involved in the care of the parish; (3) afford an opportunity for the progressive development of the student's knowledge and ministerial skills through responsible participation in the life of the church; (4) contribute leadership to churches in the region.

Types of Field Education. (1) Student Pastors, appointed by conferences or other official agencies of a recognized denomination. A student must have the approval of the Director of Field Education, as the agent of the Dean, before accepting an appointment as a student pastor. All students serving in this program must secure credit for Practicum I. (2) Winter assistant pastors, assigned by the Director of Field Education, in consultation with the pastor and/or other leaders of local churches, to serve during the academic year. (3) Other church-related positions, such as teaching church school classes, counseling youth groups, etc. (4) Summer assistant pastors under the Endowment and Field Education Program. This is a program of ten weeks' service in Methodist rural charges of North Carolina, under the appointment and supervision of the Director of Field Education, in cooperation with District Superintendents and pastors. All students serving in this program must secure credit for Practicum II and participate each year in the preparatory training sessions, planned by the Duke Endowment Student Association in collaboration with the Director of Field Education.

Supervision. Through the coordinated efforts of the Divinity School, the local churches, District Superintendents, and pastors there is continuous supervision of all students participating in the Endowment and Field Education Program. Under the general direction of the Director of Field Education, members of the administrative and teach-

ing staff as well as graduate students share in administering this program.

Supervision is carried on through: (1) Practicum I, required in the first semester of service as a student pastor, and Practicum II, required of all students working in the Summer Endowment and Field Education Program; (2) Regular visits by supervisors to charges served by student pastors and assistant pastors, followed by student-supervisor conferences; (3) Seminars (one day) for supervisors; (4) Regular reports from all students and charges to the Endowment and Field Education Office.

The Time Element of Field Work. (1) While the student pastor carries a reduced academic load (see page 36) his divinity studies provide his chief concern and occupation. The amount of time given to parish responsibilities is necessarily limited. (2) It is expected that students serving as assistants during the academic year will be limited ordinarily to 12 to 15 hours of field service per week. A more extensive responsibility beyond such a number of hours will require the student to reduce his academic load. (3) Students serving as church school teachers, youth counselors, and in similar positions are ordinarily expected to devote no more than 3 to 6 hours to this service per week.

Scholarship Resources

CERTAIN special funds have been established, the income from which is used to provide financial aid through scholarships and grants-in-aid for students wishing to secure training in preparation for the Christian ministry. The resources listed below include endowed funds and sources of annual contributions.

R. Ernest Atkinson Legacy

In 1952, under the will of the Reverend R. Ernest Atkinson of Richmond, Virginia, a member of the Trinity College Class of 1917, a sum of money was given to the Divinity School, the income to be used for the benefit of the School.

Mary Reynolds Babcock Foundation Scholarships

Through the generosity of the Mary Reynolds Babcock Foundation of Winston-Salem, North Carolina, a limited number of scholarships in an amount not exceeding $1,400 per year are granted to students in candidacy for the B.D. degree, on nomination and decision of the Dean and Committee on Scholarships and Financial Aid.

E. M. Cole Fund

In 1920 Mr. Eugene M. Cole, a Methodist layman, of Charlotte, North Carolina, established the E. M. Cole Fund, the proceeds from which are to be used in providing assistance for ministerial students.

The Duke Endowment

Among the beneficiaries of the Duke Endowment are the rural Methodist Churches of the two North Carolina Conferences. Under the Maintenance and Operation Program grants-in-aid are available for Duke Divinity School students to serve as assistant pastors under the Endowment and Field Work Program.

N. Edward Edgerton Fund

In 1939 Mr. N. Edward Edgerton of Raleigh, North Carolina, an alumnus of Duke University of the Class of 1921, a member of the Board of Trustees of the University, established the N. Edward Edgerton Fund. The award is limited to students who are candidates for the B.D. degree.

Thomas Jefferson Finch Scholarship

In 1955 Mr. George Davis Finch, '24, and Mr. Brown Faucette Finch, '54, established an annual scholarship in the amount of $650 a

year in memory of Mr. Thomas Jefferson Finch, Trinity College Class of 1884, who was the father and grandfather of the donors.

The James A. Gray Fund

In 1947 Mr. James A. Gray of Winston-Salem, North Carolina, presented the fund, which bears his name, to the Divinity School for use in expanding and maintaining its educational services in behalf of North Carolina churches and pastors. From this fund three scholarships are awarded; two in city church work, and one in rural church work. The Divinity School Seminars and a number of scholarships in the School for Supply Pastors are also supported by income from this gift, as well as the James A. Gray Lectures.

P. Huber Hanes Scholarship

Mr. P. Huber Hanes of Winston-Salem, North Carolina, an alumnus of Duke University of the Class of 1900, has established for Duke University an annual scholarship fund, a portion of which is used to provide financial assistance for Divinity School students.

George M. Ivey Scholarship Fund

This fund was established December 8, 1948, by gift of George M. Ivey, of Charlotte, North Carolina, an alumnus of Duke University of the Class of 1920, the income to be used for scholarship aid for deserving students in the Divinity School.

Lewis Clarence Kerner Scholarship

This scholarship fund was established May, 1959, by Beatrice Kerner Reavis, of Henderson, North Carolina, in memory of her brother, Lewis Clarence Kerner. The income from the principal of this fund is designated for the assistance of native or foreign-born students preparing for service in world Christian missions.

Laurinburg Christian Education Fund

This fund was established December 11, 1948, by gift through the Methodist College Advance Fund, the income to be used for scholarship aid for worthy students of the Divinity School.

Myers Park Scholarship Fund

The Myers Park Scholarship Fund was established in 1948 by contributions of the members of the congregation of the Myers Park Methodist Church, Charlotte, North Carolina, the income to be used for the benefit of the Divinity School.

W. R. Odell Scholarship

In 1946 the Forest Hills Methodist Church, Concord, North Carolina, established a scholarship fund in memory of W. R. Odell, for many years a member of the Board of Trustees of the University.

JESSE M. ORMOND SCHOLARSHIP FUND

In 1948 the North Carolina Conference established a fund in honor of Professor Jesse M. Ormond, who for many years was Director of Field Work in the Divinity School and Professor of Practical Theology.

GILBERT T. ROWE MEMORIAL SCHOLARSHIP FUND

The Gilbert T. Rowe Memorial Scholarship Fund was established through the generosity of Divinity School Alumni and friends of the late Gilbert T. Rowe. The interest on this fund is employed annually for a limited number of senior honor scholarships. Rising senior students with exceptional records and promise of usefulness in the Christian ministry are eligible for grants under this scholarship program.

ELBERT RUSSELL SCHOLARSHIP

In 1942 the Alumni Association of the Divinity School established a scholarship fund in honor of Elbert Russell, late Dean of the Divinity School and for a number of years Professor of Biblical Theology.

HERSEY E. SPENCE SCHOLARSHIP

In 1947 the Steele Street Methodist Church of Sanford, North Carolina, established a scholarship fund in honor of Professor Hersey E. Spence, a former pastor of the congregation, the income to be used for scholarship aid to deserving students of the Divinity School.

THE METHODIST CHURCH

The Methodist Church makes a substantial contribution to the Divinity School by designating a certain percentage of its World Service offerings to the school.

The North Carolina and the Western North Carolina Conferences direct a certain percentage of their College Sustaining Funds to the Divinity School. The South Carolina Conference is a contributor to the Divinity School operational income.

The General Board of Education makes available annually two National Methodist Scholarships having a cash value of $500 each. (See pages 60-61.)

Local Methodist churches throughout the Southeast make contributions to the scholarship funds of the Divinity School, thus making it possible to assign students under the Endowment and Field Work Program to urban and out-of-state churches.

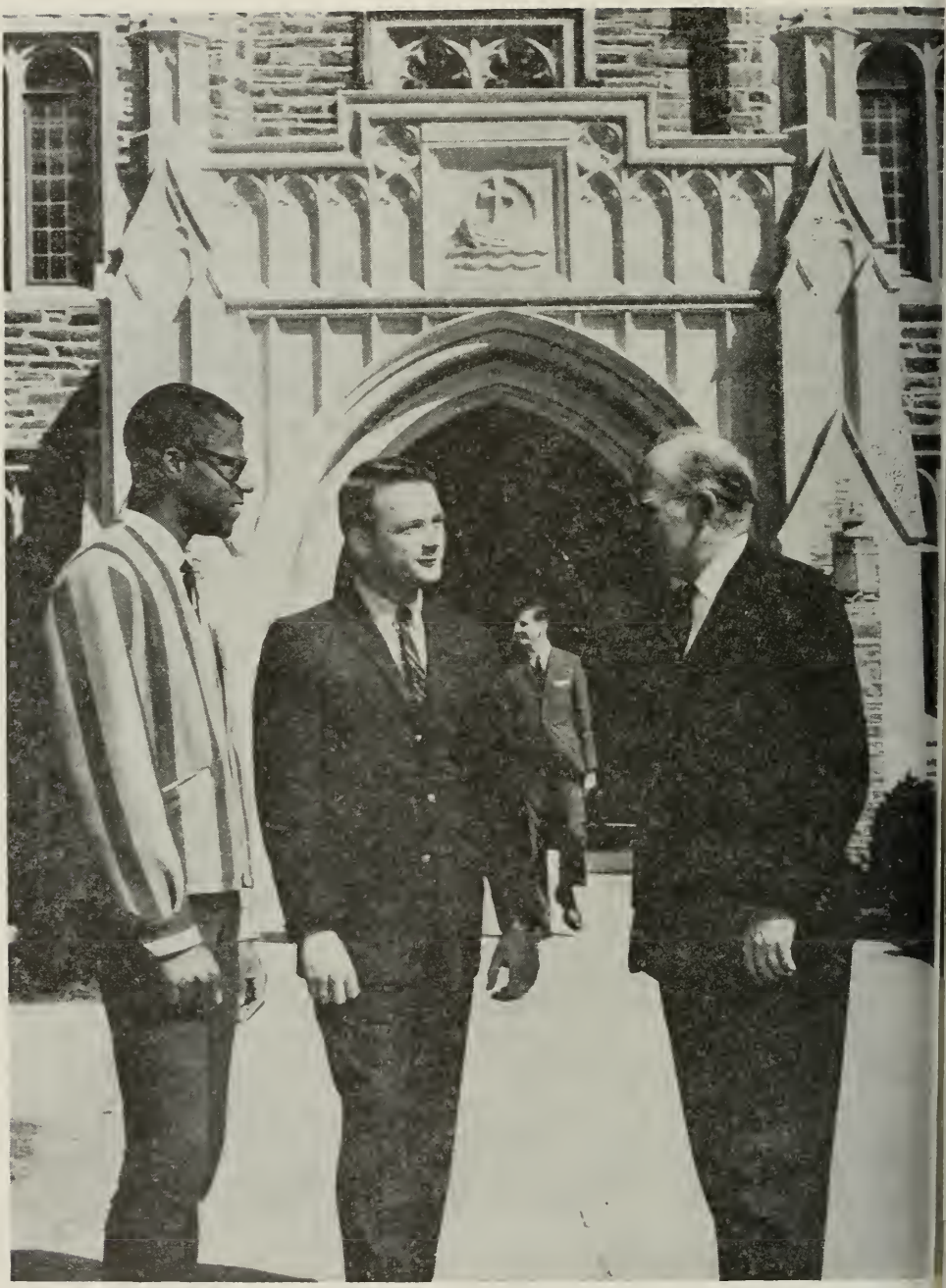
THE METHODIST COLLEGE ADVANCE

The Divinity School was a participant in the North Carolina Methodist College Advance with askings of $200,000 for scholarship

aid and extension of the School's service to ministers. Many local churches and individuals have shared in the raising of this significant sum. Specific contributions are the Henry Harrison Jordan Loan Library, the James A. Gray Fund, the J. M. Ormond Fund, the Laurinburg Christian Education Fund, the Hersey E. Spence Fund, and the Myers Park (Charlotte, North Carolina) Methodist Church Fund.

Dempster Graduate Fellowships

The Methodist Board of Education offers each year the Dempster Graduate Fellowships for graduates of Methodist Theological Schools, who are engaged in programs of study leading to the degree of Doctor of Philosophy in Religion with a view to teaching in Methodist colleges and seminaries. Several Divinity School graduates have held these fellowships.



The Summer Session of the Divinity School

Summer, 1965

Class enrollments will be controlled as occasion may arise so as to secure a fairly even distribution among the courses offered in each term.

FIRST TERM: (Registration June 12—Classes begin June 14 and end July 17)

124 (DS). MORAL THEOLOGY IN THE TWENTIETH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of William Temple and selected contemporary theologians. 11:00-12:20. 3 s.h. HARMON SMITH

195 (DS). ORIGINS OF DOGMATIC THOUGHT.—An analysis of dogmatic concepts in the Gospel of John: their development into a body of doctrine. 7:40-9:00. 3 s.h. HERZOG

261 (DS). THE THEOLOGY OF JOHN WESLEY.—A study of the development and structure of Wesley's theology, with special reference to his doctrines of man and salvation. 9:20-10:40. 3 s.h. RICHEY

SECOND TERM: (Registration July 19—Classes begin July 20 and end August 24)

16 (DS). CONTEMPORARY WESTERN CULTURE.—An analysis of the conceptual commitments in contemporary styles of thought and life as reflected in the natural sciences, philosophy, social analysis, and the arts. 9:20-10:40. 3 s.h. POTEAT

140 (DS). THE RISE OF METHODISM AND THE ANGLICAN BACKGROUND.—The Methodist societies within the Church of England to the death of Wesley. 11:00-12:20. 3 s.h. BAKER

170 (DS). INTRODUCTION TO PASTORAL COUNSELING.—The philosophy and techniques of formal counseling through discussions of textual and interview material. 7:40-9:00. 3 s.h. GOODLING

Enrollment 1964-65

Fall Semester

CANDIDATES FOR THE BACHELOR OF DIVINITY DEGREE

Adams, Lawrence Clay (A.B., Pfeiffer College), Asheville, N.C.
Adams, Quay Wyatt (A.B., Wofford College), Darlington, S.C.
Aiken, David Hubert (B.A., Baylor University), Atlanta, Ga.
Albury, George Richard (B.A., Williams College), Coral Gables, Fla.
Alexander, Robert Earl (A.B., Duke University), Kinston, N.C.
Allen, Harry A. (B.S., Wofford College), Charlotte, N.C.
Allen, John Cornelius III (A.B., Duke University), Burlington, Vt.
Allport, Henry Braxton, Jr. (B.A., Randolph-Macon College), Alexandria, Va.
Ambrose, Kenneth Paul (A.B., West Virginia Wesleyan College), Belle, W.Va.
Anderson, Thurman Wilson (A.B., Wofford College), Conway, S.C.
Arrowood, Wayne Dee (B.A., Texas Christian University), Fort Worth, Tex.
Ashby, Warren Allen (A.B., University of North Carolina), Chapel Hill, N.C.
Attkisson, C. Clifford, Jr. (A.B., University of Richmond), Richmond, Va.

Ballard, James Donald (A.B., Shaw University), Winston-Salem, N.C.
Billings, James Wayne (A.B., Pfeiffer College), Bonlee, N.C.
Boggan, Robert Edmond, Jr. (A.B., Wofford College), Greensboro, N.C.
Boles, Johnny James (A.B., Guilford College), Pinnacle, N.C.
Bolyard, Roy Vance, Jr. (B.A., West Virginia Wesleyan College), Huntington, W.Va.
Bowles, Joseph Cates (A.B. Duke University), Winston-Salem, N.C.
Brown, Harold Berger, Jr. (A.B., University of Chattanooga), Atlanta, Ga.
Brusati, John Francis (B.A., Southwestern College), Elmhurst, Ill.
Bryan, James Lawson (A.B., Duke University), Silk Hope, N.C.
Buie, Franklin Burgess (A.B., Wofford College), Columbia, S.C.
Burberry, Clyde David (A.B., Kentucky Wesleyan College), Paris, Ky.
Burgart, John Dewey II (B.A., Wake Forest College), Greensboro, N.C.
Buzzard, Lynn Robert (A.B., Duke University), Gladstone, Ore.

Cain, Louie Bingham, Jr. (A.B., Lambuth College), Camden, Tenn.
Caldwell, James Franklin (B.A., Tulsa University), Tulsa, Okla.
Callahan, John Paul (A.B., Wofford College), Lexington, S.C.
Campbell, Robert B. (B.A., Columbia College), Jackson Springs, N.C.
Campbell, Richard E. (B.A., West Virginia Wesleyan College), Lockport, N.Y.
Cassady, Tommy Lee (A.B., Wofford College), Charlotte, N.C.
Cato Harold Eugene (A.B., University of North Carolina), Greensboro, N.C.
Chambers, Alex A. (A.B., Stillman College), Chapel Hill, N.C.
Charlesworth, James Hamilton (B.A., Ohio Wesleyan University), Ponte Vedra Beach, Fla.
Chesnut, John H. (B.S., University of Chicago), Louisville, Ky.
Clanton, Robert Alpheus, Jr. (A.B., Pfeiffer College), Hillsboro, N.C.
Clarke, Clifford Harvey (B.A., Wake Forest College), Tokyo, Japan
Clifton, Thomas E. (A.B., William Jewell College), Crystal City, Mo.
Cohen, Conrad Maurice (A.B., Western Maryland College), Milford, Del.
Coleman, Gerald Price (B.A., Grand Canyon College), Lynchburg, Va.
Combs, Don Caudill (B.A., Oklahoma City University), Midwest City, Okla.
Cook, Jerry O'Neill (A.B., Wofford College), Startex, S.C.
Cook, Reece Edward, Jr. (B.A., Catawba College), Concord, N.C.
Cox, Boyce Vernon, Jr. (B.A., Wake Forest College), Winterville, N.C.
Cox, Richard Lewis (B.A., University of Maryland), Towson, Md.
Cunningham, Lloyd Thomas (B.A., Florida Southern College), Miami, Fla.

Daily, Thomas Carroll (B.A., Emory and Henry College), Santo Domingo, Dominican Republic
Davenport, John Paul (B.S., Appalachian State College), Newland, N.C.
Davis, Carlton Earl (B.S., North Carolina State College), Goldsboro, N.C.
Davis, Creed Shelton, Jr. (B.A., Randolph-Macon College), Richmond, Va.
Davis, Hubert Trevelyan (B.S., University of Alabama), Troy, Ala.
Davis, Joe Cliff (A.B., Lenoir Rhyne College), Ellenboro, N.C.
Dickerson, Dennis Roy, Jr. (A.B., Wofford College), Spartanburg, S.C.
Dorsey, John Matthew (A.B., Pfeiffer College), Charlotte, N.C.
Dowda, Robert Ellis (A.B., Birmingham-Southern College), Birmingham, Ala.
Draper, Howard Dennis, Jr. (A.B., High Point College), Fayetteville, N.C.
Duncan, Thomas Jefferson, Jr. (A.B., Greensboro College), Greensboro, N.C.
Dutton, Denis C. (B.A., Ohio Wesleyan University), Singapore, Malaysia

Eanes, Ralph Hill, Jr. (A.B., University of North Carolina), Thomasville, N.C.
Earnhardt, Daniel Thomas (A.B., High Point College), Durham, N.C.

Echols, Charles Robert (B.S., West Virginia Wesleyan College), Richmond, W.Va.
Ellis, Edgar Heb (A.B., St. Andrews Presbyterian College), Spartanburg, S.C.
Ellison, William Byrd (A.B., High Point College), Summerfield, N.C.
Embry, Foster Alvin (A.B., Georgia State College), Marietta, Ga.
Ennis, Gordon Earl (B.A., Campbell College), Erwin, N.C.

Falls, Fred (A.B., Pfeiffer College), Kings Mountain, N.C.
Fearnow, Raymond Morrison (B.A., University of Richmond), Mechanicsville, Va.
Felder, Charles Bertram (B.A., Millsaps College), Liberty, Miss.
Fell, Stanley LaVerne (B.S., Gannon College), Erie, Pa.
Ferguson, Horace Taylor (A.B., Atlantic Christian College), Pleasant Hill, N.C.
Fortenberry, Donald Peyton (B.A., Millsaps College), Summit, Miss.
Fox, Carol Rogers (A.B., Duke University), Roxboro, N.C.
Frame, David James (B.A., Drew University), Philadelphia, Pa.
Freeman, James Herbert (A.B., Wofford College), Greenville, S.C.
Freitas, Daniel Philip (A.B., Union College), Braintree, Mass.

Gaffron, David William (B.S., University of Illinois), Decatur, Ill.
Gamble, Harry Yandle, Jr. (B.A., Wake Forest College), Roanoke, Va.
Gardner, Carlos Owen, Jr. (A.B., Pembroke State College), Chadbourn, N.C.
Garrett, Edward Mann, Jr. (A.B., University of Richmond), Richmond, Va.
Goh, Francis Swee Huat (B.A., West Virginia Wesleyan College), Penang, Malaysia
Gragg, James Printest (B.A., Oklahoma City University), Altus, Okla.
Griffeth, James Ellis (A.B., Wofford College), Greenville, S.C.
Griffith, Lloyd Edward, Jr. (A.B., Duke University), Durham, N.C.
Griffith, Randolph Jennings (B.A., Furman University), Saluda, S.C.
Grove, John Wesley (A.B., Western Maryland College), Baltimore, Md.

Hall, Elmer O. (A.B., High Point College), Gibsonville, N.C.
Hamilton, Wayne Bruce (B.S., Wake Forest College), Washington, D.C.
Hardin, Elliott Wannamaker, Jr. (A.B., Duke University, M.B.A., University of Texas), Rock Hill, S.C.
Harmon, Samuel Kaiser (A.B., Wofford College), Lexington, S.C.
Harper, Eugene James (A.B., Wofford College), Chesnee, S.C.
Herman, James Franklin (A.B., Pfeiffer College), Bessemer City, N.C.
Hester, Ernest Carrington, Jr. (A.B., Campbell College), Durham, N.C.
Hewett, James Allen (A.B., Duke University), Shallotte, N.C.
Higginbotham, John Avon (B.A., Millsaps College), Raleigh, N.C.
Hobbs, John Whitfield (A.B., University of North Carolina), Wilmington, N.C.
Holliday, Richard Carrington (A.B., Morris Harvey College), Buckingham, Va.
Horton, Larnie Glenn (A.B., Morris Brown College), Chapel Hill, N.C.
Huntington, Warren Fielding (A.B., University of Miami), Hialeah, Fla.
Hurt, Michael Winston (B.A., Illinois Wesleyan University), Collinsville, Ill.
Hutchinson, William Wayne (B.A., University of Oklahoma), Hobbs, N.M.
Hutton, Clifford Earl (B.A., McMurry College), Tularosa, N.M.

Ingram, Franklin Wade (A.B., Duke University) Columbus, Ga.
Ivey, Daniel Keith (B.A., New Mexico State University), Las Cruces, N.M.

Jamison, Louis Dwight (A.B., Wofford College), North Charleston, S.C.
Jarvis, Frank Melvin (A.B., High Point College), High Point, N.C.
Jayroe, Harold Benjamin (A.B., Wofford College), Georgetown, S.C.
Johnson, Clarence Reginald (B.A., Wake Forest College), Greenville, N.C.
Johnson, Oscar (B.S., Agricultural and Technical College of North Carolina), Greensboro, N.C.
Jones, Royce Paul (B.A., Texas Christian University), Garland, Tex.
Juren, Jerry Jay (A.B., Atlantic Christian College), Timberlake, N.C.

Kerr, William Andrew (A.B., West Virginia University), Morgantown, W.Va.
King, Charles Benjamin (A.B., Randolph-Macon College), Dry Fork, Va.
King, Clarence Dewey (A.B., West Virginia University), Morgantown, W.Va.
Kirk, John Alan (B.A., Evansville College), Oblong, Ill.
Knott, John Buxton III (A.B., University of North Carolina), Durham, N.C.

La Torre, Stanley Edward (B.S., The College of Charleston), Charleston, S.C.
Little, Thomas Clarence (A.B., King College), Dayton, Tenn.
Long, James Baxter, Jr. (A.B., Pfeiffer College), Concord, N.C.
Lovell, Eugene Hendrix, Jr. (B.A., Emory and Henry College), Old Hickory, Tenn.

McCleskey, James Lawrence (A.B., Duke University), Tampa, Fla.
McMahan, William Franklin (A.B., Randolph-Macon College), Salem, Va.
McNeill, William Kirk (A.B., Pfeiffer College), Fayetteville, N.C.

Maddry, Sam Alexander (A.B., Scarritt College), Pittsboro, N.C.
Mahone, Donald Ray (B.A., Emory and Henry College), Richlands, Va.
Mahood, William Thomas, Jr. (B.A., Morningside College), Wilmington, Del.
Mann, Samuel E. (B.A., Birmingham Southern College), Eufaula, Ala.
Manthey, Robert Edward (A.B., Western Maryland College), Baltimore, Md.
May, Harold Lloyd (A.B., West Virginia University), Lakeland, Fla.
Meeks, Merrill Douglas (B.A., Southwestern at Memphis College), Memphis, Tenn.
Monson, Robert Clyde (A.B., Wofford College), Florence, S.C.
Montford, Charles Harold (B.A., Florida State University), Chattahoochee, Fla.
Moore, Stephen R. (B.S., University of Wisconsin), Flossmoor, Ill.

Morgan, Clay Johnson (A.B., Pfeiffer College), Troy, N.C.
Morris, William Robert (A.B., Wofford College), Lake View, S.C.
Morton, Fred Clare (A.B., Princeton University), Memphis, Tenn.
Murphy, Ervin Thomas, Jr. (A.B., Randolph-Macon College), Norfolk, Va.
Murray, Eric Octavious (Th.B., Nyack Missionary College), Roxboro, N.C.

Neaves, Norman Earl (B.A., Oklahoma City University), Oklahoma City, Okla.
Nelson, Gordon Vernon, Jr. (A.B., Randolph-Macon College), Colonial Heights, Va.
Newman, William Winter (B.S., University of North Carolina), Burlington, N.C.
Nobles, William Michael (B.S., Richmond Professional Institute), Portsmouth, Va.
Nolin, George Damon (A.B., Birmingham-Southern College), Montgomery, Ala.
Norman, John Phillip (A.B., Erskine College), Homeland, Fla.
Norred, Jimmy Jerry (B.A., LaGrange College), LaGrange, Ga.

Osborne, William Homer, Jr. (A.B., Pfeiffer College), Asheboro, N.C.

Parchman, Russell Carver (B.A., McMurry College), Loving, N.M.
Parsons, Barbee Olis (A.B., Coker College), Hemingway, S.C.
Paschal, John Sidney (A.B., Scarritt College), Sanford, N.C.
Peterson, Francis Gerald (A.B., Boston University), Chicago, Ill.
Peurifoy, Clarence Edward (A.B., Greensboro College), Concord, N.C.
Phelan, Andrew Carnegie, Jr. (B.A., Lambuth College), Middlesex, N.C.
Pierce, Fred Perry (B.S., University of North Carolina), Burlington, N.C.
Pollock, George Lee (A.B., Guilford College), Thomasville, N.C.
Pomrenke, Louis F., Jr. (B.A., University of Pittsburgh), Pittsburgh, Pa.
Poole, Christopher Lee (B.S., College of Charleston), Wagener, S.C.
Pope, Cletes, A., Jr. (A.B., Greensboro College), Thomasville, N.C.
Potter, Frank Hollister (B.A., Wake Forest College), Beaufort, N.C.
Puffenberger, Allen Lee (B.A., University of Richmond), Luray, Va.

Ragsdale, William Robbins (A.B., Hampden-Sydney College), Leaksville, N.C.
Ramke, Ronald George (A.B., Union College), Brooklyn, N.Y.
Reskovac, John William (B.A., Oklahoma City University), Oklahoma City, Okla.
Reynolds, Thomas LeRoy, Jr. (B.A., Furman University), Clifton Forge, Va.
Richichi, Thomas Joseph (B.A., Oklahoma City University), Oklahoma City, Okla.
Roberts, Donald Lee (B.S., Lamar State College of Technology), Port Arthur, Tex.
Rouse, Benjamin Charles (A.B., High Point College), Kinston, N.C.

Sell, Jesse Jeremiah (B.A., Ohio Wesleyan University), Toledo, Ohio
Setzer, John William, Jr. (B.A., The Citadel), Marion, N.C.
Shannon, Sylvester Lorenzo (A.B., Florida A & M University), Saint Petersburg, Fla.
Sharp, Robert Thomas (B.A., Millsaps College), Meridian, Miss.
Sharpe, Jack Larry (A.B., Birmingham-Southern College), Langdale, Ala.
Sharpe, John Lawrence III (A.B., Wofford College), Columbia, S.C.
Shelton, Ruffin Page (A.B., Duke University), Durham, N.C.
Shingleton, Edward Daniel (A.B., Atlantic Christian College), Wilson, N.C.
Skaar, Arnold H. (A.B., Bucknell University), Princeton, N.J.
Singleton, Homer Carleton, Jr. (A.B., University of Alabama), Foley, Ala.
Sledge, Donald Dennis (A.B., Marion College), Burlington, N.C.
Smith, Charles Michael (A.B., Duke University), Washington, N.C.
Smith, Gerald LaFayette (B.A., University of Richmond), Fredericksburg, Va.
Spake, William Monroe, Jr. (A.B., High Point College), Asheville, N.C.
Steed, Roy Glenn (A.B., High Point College), Ca-Vel, N.C.
Steuart, Thomas Albert (B.S., University of Florida), Tampa, Fla.
Stith, Frank Albert, III (A.B., Duke University), Winston-Salem, N.C.
Stokes, Clarence O'Dell (A.B., St. Andrews Presbyterian College), Camden, S.C.
Stone, Samuel Marion IV (A.B., Duke University), Charleston, W.Va.
Suzuki, Yugo (A.B., Randolph-Macon College), Tokyo, Japan
Swann, Marion Milton (A.B., Pfeiffer College), Spruce Pine, N.C.

Taggart, James Edward (A.B., Baldwin-Wallace College), Bellevue, Ohio
Taylor, Oliver Franklin (B.A., Florida Southern College), Miami, Fla.
Thomas, Herman Edward (B.S., A & T College of N.C.), Bryson City, N.C.
Thompson, Albert Ervyne, Jr. (A.B., High Point College), Henderson, N.C.
Turnbow, Frankie Lee (B.S., Florence State College), Jasper, Ala.
Turner, Frank Blair (A.B., Pfeiffer College), Midland, N.C.
Tyndall, Leslie Glenn (A.B., Duke University), Kinston, N.C.

Underwood, James S., Jr. (B.A., Stetson University), Perry, Fla.

Wade, David L. (B.A., Randolph-Macon College), Arlington, Va.
Walker, James Lynwood (B.A., North Carolina College), Fayetteville, N.C.
Wallace, Robert Louis (B.A., Mississippi Southern College), Hattiesburg, Miss.
Walters, Richard Paul (B.A., Millsaps College), Greenville, Miss.
Ward, Nathan Herman, Jr. (B.S., N.C. State, the University of North Carolina at Raleigh), Whiteville, N.C.
Washburn, Phillip Seely (A.B., Dickinson College), Roselle Park, N.J.
Weidman, Judith Lynne (B.A., DePauw University), Savanna, Ill.
Weisner, Billy Julian (B.A., Presbyterian College), Gray Court, S.C.
Wellman, Dana Richard (A.B., University of North Carolina), Annandale, Va.
Williams, Johnnie Joseph, Jr. (A.B., Guilford College), Rocky Mount, N. C.

Wilson, Arthur John III (A.B., Duke University), Durham, N.C.
Wilson, Leighton Marion, Jr. (A.B., Furman University), Tampa, Fla.
Wilson, Ronald Lynn (B.S., Howard College), Birmingham, Ala.
Winegar, Grady Clarence (B.A., Emory and Henry College), Gate City, Va.
Winter, David Earl (A.B., West Virginia Wesleyan College), South Charleston, W.Va.
Wogan, Sidney F. (LL.B., Southeastern University), Ft. Walton Beach, Fla.
Wood, Roger Wayne (A.B., Wofford College), Spartanburg, S.C.
Woodall, Edward Eugene, Jr. (B.A.. Millsaps College), Coffeeville, Miss.
Woodard, Louis Herman (B.A., Wake Forest College), Kinston, N.C.
Woodward, James Richard (B.S., Livingstone College), Avondale, Pa.
Wortman, Manuel David (A.B., High Point College), Lawndale, N.C.
Wright, Wasena Franklin, Jr. (B.A., Randolph-Macon College), Richmond, Va.

Yeo, Lawrence Thomas (B.A., Wesleyan University), Auburndale, Mass.

Zimmerman, Matthew Augustus, Jr. (B.S., Benedict College), Union, S.C.

SPECIAL STUDENTS

Bigham, William Ormand (B.D., Duke Divinity School), Brazil
Bomstad, Roland Glenwood, Jr. (B.S., B.A., University of Florida), Gainesville, Fla.
Braswell, Mae Baldwin (A.B., Greensboro College; M.R.E., Duke Divinity School), High Point, N.C
Cecil, John Harley (B.S., High Point College; B.D., Emory University), Butner, N.C.
Dutton, Emme Kwan (Ohio Wesleyan University), Kuala Lumpur, Malaysia
Lynch, Lorenzo Augustus (B.A., B.D., Shaw University), Greensboro, N.C.
Oliver, James Ralph (Duke University), Fairmont, N.C.
Ostby, Thor (Hamar Katedralskole, Hamar, Norway), Hamar, Norway
Pickett, Eugene Hadley (B.S., University of North Carolina), Raleigh, N.C.
Wade, Louis Hubert (A.B., B.D., Shaw University), Oxford, N.C.

CANDIDATES FOR THE MASTER OF THEOLOGY DEGREE

Alvord, Alexander Mapes (B.D., Pacific School of Religion), Salisbury, Southern Rhodesia
Anderson, Samuel Wyndham (B.A., University of Richmond; B.D., Union Theological Seminary, New York City), Whitakers, N.C.
Bohannon, Kenneth Lewis (B.A., University of Alabama; B.D., Vanderbilt Divinity School), Northport, Ala.
Cato, Phillip C. (A.B., Duke University; S.T.B., Episcopal Theological School, Cambridge, Mass.), Raleigh, N.C.
Clark, Richard Alan (A.B., University of North Carolina; B.D., Duke Divinity School), Statesville, N.C.
Gilbert, Douglass W. (A.B., Lambuth College; B.D., Duke Divinity School), Jackson, Tenn.
Goldston, Thomas Jennings, Jr. (B.A., Bridgewater College; B.D., Crozer Theological Seminary), South Boston, Va.
Hermanson, Sheldon Elliot (B.A., Luther College, C.T., Luther Seminary), Princeton, Minn.
Himes, John Robert (A.B., Wittenberg University; B.D., Duke Divinity School), London, Ohio
Hodges, James Bartlett (A.B., Westminster College (Pa.); S.T.B., Boston University School of Theology), Pittsburgh, Pa.
Koonts, Ronald Alva (B.D., Duke Divinity School), High Point, N.C.
Lackey, Ronald Dean (B.D., Southeastern Baptist Theological Seminary), South Hill, Va.
Lewis, Robert Russell (B.S., Furman University; B.D., Southeastern Baptist Theological Seminary), Laurel Hill, N.C.
Lovell, William Eugene (B.A., Emory and Henry College; B.D., Duke Divinity School), Nashville, Tenn.
May, Henry Elmer, Jr. (B.A., Moravian College, B.D., Moravian Theological Seminary), Winston-Salem, N.C.
Patton, William Rankin (A.B., Duke University, B.D., Philadelphia Seminary) Charleston, S.C.
Perry, Frank Caston (A.B.. Furman University; B.D., Lutheran Theological Southern Seminary), Chapel Hill, N.C.
Pharr, Phillip Allen (A.B., Pfeiffer College, B.D., Duke Divinity School), Statesville, N.C.
Rice, Jerry Lee (B.A., The College of the Ozarks; B.D., McCormick Theological Seminary), Salem, Ohio
Ruth, William Albert (A.B., University of North Carolina; B.D., Duke Divinity School), Cary, N.C.
Scott, Robert Taylor (B.S., University of Virginia; B.D., Virginia Theological Seminary), Richmond, Va.
Sessions, Dale Robert (A.B., Carson Newman College), Columbia, S.C.
Spain, John Leonard, Jr. (B.D., Southeastern Baptist Theological Seminary), Petersburg, Va.
Stauffer, Harold Lloyd (A.B., Arizona State University), Phoenix, Ariz.
Turner, Clay Howard (B.A., Southern Methodist University, B.D., Duke Divinity School), Mobile, Ala.
Yamauchi, Ichiro (B.D., Kwansei Gakuin University), Osaka, Japan

CANDIDATES FOR THE MASTER OF RELIGIOUS EDUCATION DEGREE

Ahn, Joon Hwa (B.A., Kukhak College), Seoul, Korea
Arichea, Ruth Mandac (B.R.E., Union Theological Seminary, Manila), Gattaran, Cagayan, Philippines
Browning, Judith Cook (A.B., Florida Southern College), Huntington, W.Va.
Chance, Dorathy Mae (A.B., Pfeiffer College), Lumberton, N.C.
Kaiser, Ann Marie (B.A., Oklahoma City University), Oklahoma City, Okla.
Key, Carter Fay (A.B., Emory University), Swainsboro, Ga.
Manges, Suzanne Heath (A.B., Agnes Scott College), Blacksburg, Va.
Nichols, Mary Jane (A.B., Pfeiffer College), Waynesville, N.C.
Renegar, Karen Ruth (B.A., Emory and Henry College), Radford, Va.
Sanders, Joan Allen (A.B., Millsaps College), Flemingsburg, Ky.
Winegar, Ottalee Smith (B.A., Emory and Henry College), Gate City, Va.

Enrollment Graduate Division of Religion 1964-65

Arichea, Daniel C., Jr. (A.B., Philippine Christian Colleges; B.Th., Union Theological Seminary in the Philippines; M.R.E., Duke University Divinity School), San Narciso, Zambales, Philippines
Bassett, Paul M. (A.B., Olivet Nazarene College; B.D., Duke University Divinity School; M.S., Ohio State University), Chillicothe, Ohio
Burr, David D. (A.B., Oberlin College; B.D., Union Theological Seminary, NYC), Dalton, Mass.
Campbell, J. Gordon, Jr. (B.A. Vanderbilt University; B.D. McCormick Theological Seminary), Nashville, Tenn.
Carey, John J. (A.B., Duke University; B.D., Yale Divinity School), Tallahassee, Fla.
Crossley, Ronald C. (A.B., Howard College; B.D., Southern Baptist Theological Seminary), Anniston, Ala.
Davis, Thomas R. (A.B., Dartmouth College; B.D., Union Theological Seminary, NYC), Scranton, Pa.
Gill, Jerry H. (B.A., Westmont College; M.A., University of Washington; S.T.B. Biblical Seminary, NYC), Seattle, Wash.
Goodman, Wm. R., Jr. (B.A., Washington & Lee University; B.D. Union Theological Seminary, Richmond), Lexington, Va.
Gravely, William B. (A.B., Wofford College; B.D., Drew Theological School), Pickens, S.C.
Jones, Donald L. (A.B., Ohio Wesleyan University; B.D., Methodist Theological School in Ohio), Delaware, Ohio
Koenning, Alton R. (B.A., Texas Lutheran College; B.D., Evangelical Lutheran Theological Seminary, Columbus), Ganado, Tex.
Lord, James R. (B.A., Presbyterian College; B.D., Princeton Theological Seminary; Th.M., Duke Divinity School), Dublin, Ga.
McDaniel, William (A.B., Wofford College; B.D., Harvard Divinity School), Laurens, S.C.
Morrill, Richard L. (B.A., Brown University; B.D., Yale Divinity School), Weymouth, Mass.
Mount, C. Eric, Jr. (B.A., Southwestern at Memphis; B.D., Union Theological Seminary, Richmond; S.T.M., Yale Divinity School), Crossett, Ark.
Norment, Owen L. (A.B., University of North Carolina; B.D. and Th.M., Union Theological Seminary, Virginia), Cameron, N.C
Nuckols, Thomas W. (B.A., Tulane University; B.D., Southern Baptist Theological Seminary), Burleson, Tex.
Page, Allen F. (B.A., Wake Forest College; B.D., Union Theological Seminary, NYC), Morrisville, N.C.
Patteson, Roy K., Jr. (B.A., University of Richmond; B.D., Union Theological Seminary, Richmond; Th.M., Duke Divinity School), Pittsboro, N.C.
Peery, William P. (B.A., Newberry College; B.D., Lutheran Theological Southern Seminary; M.A., Vanderbilt University), Spartanburg, S.C.
Pelt, Michael R. (A.A., Chipola Junior College; B.A., Troy State Teachers College; B.D., Duke Divinity School), Mount Olive, N.C.
Prust, Richard C. (B.A., University of Wisconsin; B.D., Yale Divinity School), Milwaukee, Wis.
Ray, Roger D. (B.A., Baylor University; B.D., Southern Baptist Theological Seminary), Corsicana, Tex.

Rice, Charles L. (B.A., Baylor University; B.D., Southern Baptist Theological Seminary; S.T.M., Union Theological Seminary, NYC), Costa Mesa, Calif.
Rogers, Charles A. (B.A., Southwestern University; B.D. and S.T.M., Perkins School of Theology), San Antonio, Tex.
Sallstorm, John E. (B.A., Elmhurst College; B.D., Union Theological Seminary, NYC), Quincy, Ill.
Schmid, Byron L. (B.A., Augsburg College; B.D., Lutheran Theological Seminary, Phila.). Argyle, Wis.
Stephenson, Keith D. (B.A., University of Nebraska; B.D. and S.T.M., Yale Divinity School). Durham, Conn.
Stines, James W. (B.A., Wake Forest College; B.D., Southern Baptist Theological Seminary). Durham, N.C.
Tatum, W. Barnes (B.A., Birmingham Southern College; B.D., Duke Divinity School), Mobile, Ala.
Thursby, Gene R. (B.A., Oberlin College; B.D., Graduate School of Oberlin College), Akron, Ohio
Webster, Charles A., Jr. (A.B., Duke University; B.D., Southern Baptist Theological Seminary, Wake Forest), Clemson, S.C.
Wiley, David N. (B.A., College of Wooster; B.D., McCormick Theological Seminary), Chicago, Ill.
Wilson, Gerald L. (A.B., Davidson College; B.D., Duke Divinity School), Winston-Salem, N.C.
Zikmund, Barbara K. (B.A., Beloit College; B.D., Duke Divinity School), Detroit, Mich.
Zinn, Grover A., Jr. (B.A., Rice Institute; B.D., Duke Divinity School), El Dorado, Ark.

Summer Session 1964

(WITHOUT DUPLICATION)

Damschroder, Linden W. (B.A., Adrian College), Elmon, Ohio
Gillis, Raymond Franklin, Jr. (B.A., Randolph-Macon College), Hampton, Va.
Kim, Myung J. (B.A., Randolph-Macon College), Richmond, Va.
Lineberger, James Worth, Jr. (B.S., North Carolina State College), New Bern, N.C.
Ross, Richmond Allan (A.B., Duke University), Durham, N.C.
Settle, Carl E. (B.A., Hendrix College), Little Rock, Ark.
Thompson, Clark Alva (B.D., Harvard Divinity School), Winston-Salem, N.C.

Enrollment Summary

Divinity School Students, academic year, 1964-65, 266; Summer Session (without duplication), 7; Graduate Division of Religion Students, academic year 1964-65, 37; Total, 310.

INSTITUTIONS REPRESENTED

Duke University, 40; Wofford College, 20; Pfeiffer College, 15; University of North Carolina, 13; High Point College, 11; Randolph-Macon College, 11; Wake Forest College, 10; University of Richmond, 8; Emory and Henry College, 7; Southeastern Baptist Theological Seminary, 7.

The following 6 each: Oklahoma City University; Union Theological Seminary, New York; West Virginia Wesleyan College.

The following 5 each: Birmingham Southern College; Furman University; Ohio Wesleyan University; Yale Divinity School.

The following 4 each: Greensboro College; Union Theological Seminary, Richmond.

The following 3 each: Atlantic Christian College; Baylor University; Florida Southern College; Guilford College; Lambuth College; McCormick Theological Seminary; Shaw University; University of Alabama; Vanderbilt University; West Virginia University; Western Maryland College.

The following 2 each: A & T College of North Carolina; Boston University; College of Charleston; Drew University; Emory University; Harvard Divinity School; Howard College; Lutheran Theological Southern Seminary; McMurry College; Oberlin College; Presbyterian College; Princeton University; St. Andrews Presbyterian College; Scarritt College; Southwestern at Memphis College; Texas Christian University; Union College; Union Theological Seminary, Manila; University of Florida; University of Wisconsin.

The following 1 each: Adrian College; Appalachian State Teachers College; Agnes Scott College; Aryma State University; Augsburg College; Baldwin-Wallace College; Beloit College; Benedict College; Biblical Seminary, New York; Brown University; Bucknell University; Campbell College; Carson Newman College; Catawba College; Chipola Junior College; The Citadel; Coker College; College of the Ozarks; College of Wooster; Columbia College;

Crozer Theological Seminary; Dartmouth College; Davidson College; DePauw University; Dickinson College; Elmhurst College; Episcopal Theological School; Erskine College; Evangelical Lutheran Theological Seminary; Evansville College; Florence State College; Florida A. & M. University; Florida State University; Gannon College; Georgia State College; Grand Canyon College; Hamar Katedralskole; Hampden-Sydney College; Hendrix College; Illinois Wesleyan University; Kentucky Wesleyan College; King College; Kukhak College; Kwansei Gakuin University; LaGrange College; Lamar State College of Technology; Lenoir Rhyne College; Livingstone College; Lutheran Theological Seminary; Marion College; Methodist Theological School in Ohio; Mississippi Southern College; Moravian College; Moravian Theological Seminary; Morningside College; Morris Brown College; Morris Harvey College; New Mexico State University; Newberry College; North Carolina College; Nyack Missionary College; Olivet Nazarene College; Pacific School of Religion; Pembroke State College; Perkins School of Theology; Philadelphia Theological Seminary; Philippine Christian Colleges; Richmond Professional Institute; Rice Institute; Southeastern University; Southern Methodist University; Southwestern College; Stetson University; Texas Lutheran College; Troy State Teachers College; Tulane University; Tulsa University; University of Chattanooga; University of Chicago; University of Illinois; University of Maryland; University of Miami; University of Nebraska; University of Pittsburgh; University of Texas; University of Virginia; University of Washington; Virginia Theological Seminary; Washington and Lee University; Wesleyan University; William and Mary College; William Jewell College; Williams College.

DENOMINATIONS REPRESENTED

	Divinity	*Graduate*
Methodist	223	8
Baptist	28	8
Lutheran	4	3
Presbyterian	4	8
United Church of Christ	3	5
Church of Christ	2	
Congregational Christian	2	
Episcopalian	2	1
Church of God	1	
Disciples of Christ	1	1
Dutch Reformed	1	
Evangelical and Reformed		1
Evangelical United Brethren		1
Greek Orthodox	1	
Moravian	1	
Nazarene		1
	273	37

GEOGRAPHICAL DISTRIBUTION

North Carolina, 106; South Carolina, 31; Virginia, 30; Florida, 16; Alabama, 12; Illinois, 9; Georgia, 8; Ohio, 8; Tennessee, 8; West Virginia, 8; Oklahoma, 7; Texas, 7; Mississippi, 6; Pennsylvania, 6; Massachusetts, 4; New Mexico, 4; Arkansas, 3; Japan, 3; Kentucky, 3; Maryland, 3; Malaysia, 3; Delaware, 2; New York, 2; New Jersey, 2; Philippines, 2; Wisconsin, 2; Arizona, 1; Brazil, 1; California, 1; Connecticut, 1; Dominican Republic, 1; Korea, 1; Michigan, 1; Minnesota, 1; Missouri, 1; Norway, 1; Oregon, 1; Southern Rhodesia, 1; Vermont, 1; Washington, 1; Washington, D.C., 1.

STATES: 33

FOREIGN COUNTRIES: 8

ACADEMIC GUIDE FOR FRESHMEN

Bulletin of Duke University

Volume 37 Number 7-B May, 1965

BULLETIN

OF

DUKE UNIVERSITY



THE UNDERGRADUATE COLLEGES

TRINITY COLLEGE
THE WOMAN'S COLLEGE
THE COLLEGE OF ENGINEERING

in cooperation with

THE SCHOOL OF NURSING

ACADEMIC GUIDE FOR FRESHMEN

1965-1966

DURHAM, NORTH CAROLINA
1965

TABLE OF CONTENTS

Introduction	3
Freshman Academic Calendar	5
Preliminary Registration for First Semester	6
Advanced Placement	8
The Curriculum	10
The Years Ahead	11
Freshman Courses and Departmental Majors	13
Registration Materials	Inside back cover

Note: *The registration materials and the supplement inserted in the pocket inside the back cover of this booklet REQUIRE ATTENTION PRIOR TO JULY 1.*

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INTRODUCTION

This brochure is designed for newly-admitted students of the undergraduate colleges of Duke University. It serves multiple purposes. It seeks to present relevant information on the freshman academic calendar, the freshman program of study, and advanced placement; to express the philosophy of the curriculum of the undergraduate colleges; to state the rationale, depth, and breadth of the courses for freshmen; to suggest the several forms of independent study open in later years; to describe the scope and coverage of the "major" in each discipline. It is also a vehicle to preliminary registration for the first semester. Finally, the booklet seeks to communicate a sense of the importance, urgency, or excitement inherent in the courses and disciplines which contribute to the training of the searching mind.

It is imperative for each entering student to become thoroughly familiar with the contents of this *Guide* and to devise a tentative program of study for the first semester. The cards in the pocket inside of the back cover of this booklet are provided for preliminary registration and must be completed and mailed according to the instructions on the first card. The *Bulletin of Undergraduate Instruction* will be of considerable help for further course information and for requirements, prerequisites, and other details extremely useful for every new student.

A fall course schedule will be made for each student on the basis of the preliminary registration and course placements indicated by academic departments after reviewing scores on CEEB Advanced Placement Examinations and Achievement Tests. It should be understood that changes in the course program may be made during Freshman Week in response to in-residence counseling and the results of Duke placement tests.

On the threshold of college, many students will have formed certain preconceived notions of what they expect to meet in their academic work. In general they will expect that their courses will be more demanding of time and of thought than were their preparatory courses. They may also expect to find a different approach, a different philosophy of learning and of values, since the primary and continuing function of university education is to assure maximum training and development of the intellectual powers of the student.

Basic to this concern is our faith in the power of a liberal education to provide a foundation for the cultivation of leadership in both the specialist and the generalist. To realize his hopes and to satisfy his needs, the Duke student will require acquaintanceship with his own heritage and tools with which to work. Having these, he may hopefully advance toward the discovery and development of his highest talents. This is the crux of the educational process, both for the individual as individual and as citizen. Duke believes that the greatest contribution to society can be expected from the highest development of the individual.

There is, of course, no royal road to learning, no one way but many through which excellence is achieved. Easy courses and easy standards are not among them. Students must be expected to assume initiative and responsibility—under the best guidance and direction possible in the University—for developing effective habits of reading and study, for organizing well a body of factual information and of drawing valid conclusions from such a body of knowledge, for dealing effectively with the intellectual content of a subject and its area; in short, for developing an intellectual and moral integrity characteristic of the best and most fruitful kind of leadership in a democracy.

In moving toward these high goals, the Duke student has available a program of study that provides a basic breadth of learning in several disciplines and a deepening concentration upon his chosen specialty. Available to him in each academic department is a supervisor of freshman instruction and/or a director of undergraduate studies who will advise him concerning major requirements and other details of his work, and the faculty stand ready to provide the intellectual stimulus possible between co-workers in the exciting adventure of learning.

Since this booklet is an academic guide, it is appropriate to accent the integral nature of education: it does not occur only in the classroom, library, and laboratory. The student will find his academic experience extended, conditioned, and reinforced by the residential experience in his undergraduate college. Newly-admitted students are thus expected to begin their college work at Duke with the program of Freshman Week when they may be introduced to the total college experience.

FRESHMAN ACADEMIC CALENDAR

Bulletin of Undergraduate Instruction and *Academic Guide for Freshmen* mailed to Freshmen	June 1
Registration Materials returned by mail by Freshmen to College Office	(Prior to July 1)
Freshman Week booklet mailed to Freshmen	August
Freshman Week begins	September 17
Fall semester classes begin	September 23
Advisory grade reports due from instructors	November 6
Conferences on courses and pre-registration for the spring semester	November 15-18
Final Examination Period	January 18-28, 1966
Spring semester classes begin	February 3
Selection of a major (optional except for College of Engineering)	March 1
Advisory grade reports due from instructors	March 16
Conferences on courses of study and pre-registration for coming fall term	April 4-8
Final Examination Period	May 21-June 1

PRELIMINARY REGISTRATION FOR THE FIRST SEMESTER

Before completing the enclosed Course Program card and Course Request cards (pocket at back of brochure), refer to the *Bulletin of Undergraduate Instruction* for (1) a description of uniform requirements in each undergraduate college or school, (2) the work constituting a major in each discipline, and (3) preparation for specialized programs and professional schools. Students who have not yet found a field of greatest interest should include one or more courses that may be helpful in the later choice of a major field.

One should consider as well the possibility of his qualifying for a special section in an area of particular interest. These "sections" are available to qualified students in chemistry, English, history, mathematics, political science, and religion. Most special sections are designated by the letter *X*. Since they are especially rigorous and more demanding in time of preparation, it is not advisable to request more than one such special section.

Note: Be sure to complete course request cards only for Fall courses.

Representative Program for Freshmen in the Woman's College and Trinity College*

Fall Semester		Spring Semester	
COURSE	SEMESTER HOURS	Course	Semester Hours
English	3	English	3
Foreign Language	4(or 3)	Foreign Language	4(or 3)
Laboratory Science	4	Laboratory Science	4
One or two others (requirements or electives)	3(or 6)	One or two others (requirements or electives)	3(or 6)
Physical Education	1	Physical Education	1
Total (minimum and maximum)	15-18	Total (minimum and maximum)	15-18

*Note: For Woman's College and Trinity College freshmen, it is generally wise to include a foreign language and a laboratory science, and at least one other course that will satisfy a uniform requirement. Some students strongly interested in the humanities and social sciences may wish to postpone the laboratory science to the second year. Premedical students will generally take Math 21 (or higher course by Advanced Placement) and, in some cases, a second laboratory course.

Uniform Program for All Freshmen in the College of Engineering

Fall Semester		Spring Semester	
COURSE	SEMESTER HOURS	Course	Semester Hours
Chemistry 1	4	Chemistry 2	4
Engineering 1	2	Engineering 2	2
English 1	3	English 2	3
History 1	3	History 2	3
Mathematics 21	3	Mathematics 22	3
Physical Education 1	1	Physical Education 2	1
Total	*16	Total	*16

* Engineering students taking Air Science or Naval Science may need to schedule certain courses in addition to the program listed here.

Representative Program for Freshmen in the School of Nursing*

Fall Semester		Spring Semester	
COURSE	SEMESTER HOURS	Course	Semester Hours
English 1	3	English 2	3
History or Pol. Science	3	History or Pol. Science	3
Laboratory Science	4	Laboratory Science	4
Elective [Art, Music, Philosophy (not 48), Religion, or Literature in translation]	3	Elective	3
Nursing 1	2	Nursing 2	2
Physical Education 1	1	Physical Education 2	1
		Microbiology	3
Total	16	Total	19

*Students entering the School of Nursing should consult the **Bulletin** of the School of Nursing instead of the **Bulletin** of Undergraduate Instruction.

ADVANCED PLACEMENT

The specific content of a student's freshman program is determined, in part, by the *level* of course placement he achieves. (This is readily seen in Chemistry 1 and Physics 41 where course enrollment is contingent upon the student's eligibility for Mathematics 17 or 21.) Accordingly, entering students may achieve advanced placement in many of the fields listed in this brochure through three routes:

(1) CEEB *Advanced Placement Examinations* (in botany, chemistry, French, German, history, Latin, mathematics, physics, Russian, Spanish, and zoology). Students who have taken one or more Advanced Placement Examinations will be notified by letter prior to the beginning of fall semester classes whether they have earned advanced placement.

(2) CEEB *Achievement Tests* (in foreign language and mathematics). Students will receive notification of their course placement early in Freshman Week. Whether or not a student elects to take at Duke a subject in which he has received advanced placement is, naturally, his own decision.

(3) DUKE *Freshman Week Placement Tests.* A student who has not taken a CEEB Achievement Test in mathematics or one in a particular foreign language, and who desires to continue at Duke work in these specific areas, will have the opportunity to qualify for advanced placement on the basis of tests administered during Freshman Week.

Students entering Trinity College or the Woman's College will either continue work in a foreign language at the assigned placement level or will begin another language at the elementary level. Students assigned to a foreign language course numbered 91-92 who have confidence in their ability to understand the spoken language (does not apply to Greek or Latin) are urged to discuss with the appropriate Director of Undergraduate Studies the possibility of placement in a course at the 100-level.

The mathematics placement test establishes whether a student is qualified for Mathematics 17, 21, or 41. Freshmen who believe they are eligible for placement beyond Mathematics 41 on the basis of having had one or more courses in introductory calculus in sec-

ondary school and who have not taken the CEEB Advanced Placement Test in mathematics are invited to see the Supervisor of Freshman Instruction in Mathematics early in Freshman Week.

Freshmen who anticipate taking the Duke Freshman Week placement tests and who expect to enter economics, business administration or accounting, engineering, pre-medical or pre-dental, mathematics, or science fields are advised to review their secondary school mathematics, particularly algebra (e.g., factoring, fractions, linear equations in one, two, and three unknowns, functions and graphs, exponents and radicals, and elements of quadratic equations) in order to qualify for Mathematics 21 or Mathematics 17.

In the area of foreign languages, a student who is reviewing for the Duke placement test in French, German, Russian, or Spanish should know that these tests are the CEEB type with two distinct parts:

1. A section on reading comprehension. A student may prepare for this by extensive rapid reading. He should strive for general comprehension rather than translation.
2. A test of basic grammar. A student may prepare for this section by a review of basic grammar with particular attention to regular and irregular verbs.

Finally, inasmuch as a physical performance test (see Physical Education, page 48) is administered at the inception of the fall semester, the student is well-advised to condition himself for this activity prior to Freshman Week.

THE CURRICULUM

A liberal education includes breadth as well as depth of intellectual training and development. In terms of breadth the University believes that each student should acquire the use of at least two of the three fundamental tools of civilized life: *English, mathematics,* and a *foreign language.* In addition he should be introduced in some detail to the way the scientist operates in one or more fields: *physics, chemistry, zoology, botany,* or *geology.* Each student should also gain a clearer understanding of the *religion* of western civilization. He ought to be introduced to the modes of appreciating *literature, art, music,* or *philosophy.* Moreover, he should know something about man and his relationship to society through one or two of the following areas: *economics, history, political science, philosophy of education, psychology,* or *sociology.* Finally, as a complement to the academic program, he ought to be involved in *physical education* since physical fitness is desirable for a person engaged in intellectual endeavor. To this end a program of distribution is prescribed for each student. The *Bulletin of Undergraduate Instruction* gives the details of these uniform requirements for each type of degree.

This desirable breadth must be complemented by the depth and concentration of a major, i.e., a program of advanced study in a particular subject, such as history, English, or chemistry, and related study in appropriate allied fields. The University believes that a disciplined, intensive, and thorough approach to knowledge is essential for the educated person. Only through concentrated study can one begin to master a field, perceive its unique character, appreciate its contributions to human knowledge, and grasp its methods as well as its limitations. Perhaps the most important value of rigorous study in a single discipline is its impetus toward life-long self-education.

THE YEARS AHEAD

Although the entering student is primarily concerned with achieving a balanced and challenging course program for his freshman year, he should be aware of the opportunities that lie ahead. The freshman year has its own unity, its own satisfactions, yet it is also a part of the foundation which will support the whole of his undergraduate education. Elsewhere, indeed in many quarters, he will have access to information and counsel as to how to prepare a course program for his first semester in line with his interests and possible area of concentration and career. Here his attention should be directed to many opportunities relating to how he pursues his education, whether entirely formally or to a degree "informally" and independently.

Formal education is course-oriented education and appropriately will comprise the bulk of each student's undergraduate program. The opportunities are suggested by the broad spectrum of courses in the undergraduate curriculum, a minimum of which are required or may be taken during an undergraduate career. Still other opportunities involve study abroad in lieu of some portion of one's work at Duke.

By contrast, informal education is basically accomplished on an individual or tutorial basis. It takes advantage of techniques such as auditing courses, e.g., in cases where a crowded schedule does not permit electing them for credit; "reading out" of an introductory course during the summer in order to move quickly to advanced work in an area; directed reading or independent study to pursue a topic not developed in a formal course; or original research leading to the preparation of a mature paper under the Graduation with Distinction Program to develop one's skill as a scholar.

It is neither possible nor desirable that one make decisions about his total course program or his participation in programs of informal study until he has sharpened his interests, gained intellectual sophistication, and acquired a firm background. Yet the freshman year is fundamental to one's total program; and, to a significant degree, one's eligibility for or interest in the informal modes of approach depend on one's freshman work. Accordingly, each student is urged to plan ahead now even though he may revise his ideas

several times as he progresses. The section on "Honors and Other Special Programs" in the *Bulletin of Undergraduate Instruction* is a good source of information about many of these special opportunities but there are other resources on campus, most of which will be introduced during Freshman Week.

FRESHMAN COURSES AND DEPARTMENTAL MAJORS

Expanded descriptions of courses open to freshmen are provided in this section. Those numbered 50 or above are open to first semester freshmen only via advanced placement.*

The course descriptions are accompanied by descriptions of programs of concentration within the various academic departments. Each department offers one or more such majors in which a student may concentrate and bring to focus his intellectual interests.

For the incoming freshman these statements of the scope and rationale of majors are relevant in terms of planning. However vague his ideas of an eventual choice of an area of concentration, he will in part be guided by them as he works out his course program for the first semester. Each student will wish to explore at least one course in the area most congenial to his interests.

The first opportunity to declare a major and be formally advised by a faculty member in the department one chooses will occur in the spring of the freshman year. All students, however, will be asked to make a choice no later than the spring semester of their sophomore year.

AEROSPACE STUDIES

(Trinity College and the College of Engineering)
Aerospace Studies 2 (Fall or Spring)
Defense of the United States

A student should request enrollment in Aerospace Studies 2 *only* during Freshman Week after conversation with representatives of the Aerospace Studies Department. See the statement below for more information.

Aerospace Studies

Freshmen who wish to obtain a commission in the Air Force while earning a degree may do so by enrolling in one of two Air

* Exceptions are English 51 and Sociology 91, which are open both semesters to all freshmen, Economics 57 and Geology 51, which are open in the fall to freshmen with SAT verbal and mathematics scores of 600 or higher, and Psychology 91, which is open in the spring semester to all freshmen.

Force ROTC programs offered at Duke. They may obtain full particulars no earlier than Freshman Week but will want to talk with representatives of the department about the programs at that time.

Students not interested in scholarship assistance may defer enrollment in Air Force ROTC courses until the junior year. Students wishing to enroll in the two-year program, must apply for entry into the cadet corps during the spring of the sophomore year; attend a six weeks summer encampment at an Air Force Base during the summer between the sophomore and junior years; and enroll in one three semester hour AFROTC course for each of his remaining four semesters.

The student interested in scholarship assistance, should enroll in the four-year AFROTC program. He will enroll in Aerospace Studies 2, "Defense of the United States," two semester hours, preferably during the fall semester of his freshman year. This course involves a study of the causes of world conflict, the problems of United States security, and the role of the Armed Forces as instruments of national policy. During the Spring Semester freshmen will normally not be enrolled in Aerospace Studies courses. In addition to the single course requirement during the freshman year, the student must participate in leadership laboratory, one and one-half hours each Monday afternoon during both the Fall and Spring semesters.

ART

Art 1 (Fall), 2 (Spring), Introduction to Art History

Art 1-2 serves as a general introduction to studies in archaeology, art history, and criticism. Emphasis is placed on the chronological development of architecture, sculpture, painting, and minor arts as material manifestations of the culture of Western man from ancient to modern times. In addition to revealing cultural history, the course introduces the student to principles and terminology related to form, materials, and techniques in the visual arts and develops within the student some insight for critical judgment and discrimination of works of art. Although Art 1-2 is not prerequisite to upper-level courses, the orientation it provides would be helpful in further art studies.

Art 53 (Fall), 54 (Spring), Beginning Studio

Art 53-54 is a beginning studio course with primary emphasis on drawing. It is prerequisite to further courses in painting or printmaking and may be taken by freshmen only by consent of the

instructor on evidence of previous work. It requires three afternoons per week. Equal hours in art history or theory are required to validate studio credit but these need not be concurrent. Please note that Art 1L-2L will not be offered in 1965-66.

The Major in Art

The field of art embraces two areas—the practice of art and art history—which represent different, but not mutually exclusive, avenues for the acquisition of knowledge and experience in the visual arts.

Courses in the practice of art serve the purposes of a liberal education because they are concerned with basic skills in drawing, painting, and printmaking through which a student may gain sufficient experience to realize his interests and aptitudes. The program at Duke does not offer professional training in specific skills, but a talented student may enter a graduate or professional school and expect to accomplish professional objectives within a three year period of concentration.

Art history is a relatively new member of the academic family of humanistic studies which was formalized only in the early part of this century. The concept of "art history" belongs, however, to the 18th century when J. J. Winckelmann first perceived the value of interpreting works of art as human data to reconstruct the social, religious, cultural, and intellectual climate within which man lives at a particular moment of history. The popular notion of "appreciationism," as such, is not a function of art history. As an academic discipline art history is first of all an aspect of cultural history and merges further with other humanistic areas, such as philosophy, religion, and literature. By the nature of its research methods and documentary sources it presupposes a concurrent development in language tools.

The two courses which will define for the beginning student the fields of art history and studio work are described above.

The student selecting art as his major will elect either art history or design for concentration. In design he will follow a prescribed sequence of courses designed to lead him from basic problems in drawing and design to the art of painting and graphics. In the history of art he will effect a chronological spread of area courses and select one area for specialization.

The department offers an honors program in art history which leads the superior student into independent study and research as a prelude to graduate study in the field. Special lectures, traveling

exhibitions, and art films are arranged by the department or the Duke University Student Union, and field trips are arranged in connection with art history and studio classes from time to time.

BIOLOGY

(See Botany or Zoology)

BOTANY

Botany 1 (Fall), 2 (Spring), Biology of Plants

Botany is plant biology. The one-year course in general botany is designed primarily for the student who will take one science course or, at most, only a few. Students who wish to major in botany will find the course stimulating, however, and may pursue special projects. Special studies, although not required, give the prospective botany major the chance to do independent work with his own instructor outside of class.

The course is a composite of lecture, discussion and laboratory. The aim of the course is to examine how environment and heredity influence what plants are and how they behave, and to study the diversity of plant types that evolution has produced. To these ends the course involves (1) observations on plants in the field and in the greenhouse, (2) microscopic studies in the laboratory, (3) laboratory and greenhouse experiments, (4) studies on the hereditary contribution to behavior, and (5) consideration of the major plant groups now inhabiting the world.

By means of lectures, reading, discussions and demonstrations in research laboratories, students are brought abreast with the latest concepts of molecular biology. By means of observations and experiments with living material from the field and from the greenhouse, students are able to place the theoretical concepts in the context of living plants.

Students with previous training in botany are eligible to take the Duke advanced placement test in botany during Freshman Week. Those students who demonstrate, through the test, a broad knowledge of botany will be exempted from the first and/or second semester of the beginning course and permitted to register for a more advanced botany course.

The Major in Botany

Some majors in botany look upon their training as leading to a career. The course work for the botany major gives an adequate

foundation for later graduate training that is required for professional activity in almost all botanical fields today.

Other students elect botany as a major even though they do not intend to become professional botanists. Botany gives a broad appreciation of biological principles from a scientific point of view. The non-preprofessional student will develop an understanding of living things, will be able to cope with practical botanical problems (for example in gardening and horticulture), and will understand more thoroughly the world around him.

The undergraduate program in botany is broad. Realizing that individual interests differ, the department takes a liberal view toward course requirements.

The botany major must take at least four one-semester courses from among the following: identification of vascular plants, anatomy, morphology, heredity, physiology, and ecology. The student may then choose from a wide selection of other courses including independent study to complete his major.

A botany major should have basic training in certain related fields. Introductory chemistry, mathematics and zoology are strongly suggested.

The department tries to bring all its majors into the center of the botanical activities at Duke. The student's program may be varied and may include research work or part-time employment with staff members, field trips and informal seminars, or even summer study-research projects on the campus or at Duke's marine biological laboratory on the coast at Beaufort, North Carolina.

CHEMISTRY

Chemistry 1 (Fall), 2 (Spring), General Inorganic Chemistry

The first semester is devoted to a consideration of the principles of chemical science. The properties of matter—gas behavior, solution phenomena, quantitative aspects of chemical reactions, chemical equilibrium—are related to the molecular structure of matter and further to the structure of the atoms themselves. The quantitative aspects of the principles are discussed extensively and, in the laboratory, a number of experiments illustrating these principles are carried out.

In the second semester a systematic study of the chemistry of the metallic and nonmetallic elements, as a function of their position in the periodic table, is supplemented by laboratory exercises in the qualitative analysis of some twenty common ions by semi-

micro techniques. An introduction to organic chemistry stressing structural isomerism and functional groups is also included.

While these courses serve as prerequisites for subsequent courses in the Department, they also provide for the non-science major an experience of some depth in the method, concept, and problems of a broadly based scientific discipline.

Chemistry 41 (Fall), Advanced General Chemistry

For able freshmen with extensive secondary school preparation in chemistry the department offers special courses. In Chemistry 41 attention is given to atomic and molecular structure, kinetic-molecular theory, the liquid and solid states, equilibrium, and thermodynamics. Introductory calculus is used during the latter half of the course. Paperbound books, mimeographed notes, and parallel reading are used as well as a text.

In the laboratory the major portion of the semester is devoted to independent investigations. In this work students are asked to formulate hypotheses to explain the behavior of simple systems and to devise and carry out experiments to test their hypotheses. Students proceed at their own rate and have the satisfaction of being introduced to research.

Criteria for selection are (1) SAT verbal and mathematics scores usually above 650, (2) an intended science or mathematics major, and (3) a score of 3 or better on the CEEB Advanced Placement Chemistry Examination or an acceptable performance on a qualifying test administered at Duke during Freshman Week.

Chemistry 42 (Spring), Introduction to Chemical Analysis

In the second semester, the special course open to well-qualified chemistry and other science majors is a mature course in the physical chemistry of solutions. Fundamental to succeeding courses in the Department, Chemistry 42 treats (1) the structure of simple organic molecules and complex ions in terms of a simplified valence bond (molecular orbital) theory, (2) the theory of solutions of electrolytes, and (3) homogeneous solution equilibria in terms of the activity concept, and (4) electro-chemistry.

Laboratory experiments are designed to illustrate the procedures of volumetric, gravimetric, colorimetric, chromatographic and instrumental analyses and to demonstrate the application of these methods to problems in quantitative chemistry and to the determination of physical constants.

Approximately three-quarters of the class will normally come from Chemistry 41, with the remainder being drawn from those students with superior performances in Chemistry 1.

The Major in Chemistry

Chemistry is defined as the science of substances and is concerned traditionally with structure, properties, and the nature of reactions which change one substance into another; yet this definition fails to suggest the full province of the science. Because of the breadth of concern of chemistry—its relation to physics and the engineering and life sciences—chemistry is also a central figure in a significant, exciting, technological and scientific revolution now gaining momentum.

In the field of chemistry, whether one's interest is in the basic or applied science, he will pursue his study at one time on the macroscopic level where "bulk" phenomena involving perhaps 10^{20} molecules are observed, and at another time on the submicroscopic level where the intimate course of reactions between individual molecules is deduced.

The program for the chemistry major is designed to give a basic understanding of the fundamental principles of chemical science and a practical knowledge of common laboratory techniques and experimental procedures. The curriculum for the Bachelor of Science degree, approved by the Committee on Professional Training of the American Chemical Society, gives intensive training in chemistry and the related disciplines of physics and mathematics, while in the curriculum for the Bachelor of Arts degree, somewhat less than half a student's time is devoted to his major and related work.

The following sequence of courses is common to both major programs. *General Chemistry* emphasizes the general theory and behavior of matter in bulk and the structure, properties, and reactions of many elements and compounds. The Periodic Table and the chemical bond are stressed. *Organic Chemistry* describes the synthetic methods, systematic behavior, and the geometry of individual compounds of carbon as well as some of the theory involved. *Physical Chemistry* offers a critical, rigorous examination of the principles underlying all areas of chemistry including the states of matter, quantum phenomena, thermodynamics, and a thorough treatment of chemical kinetics. *Analytical Chemistry* treats in depth the theory of solutions and includes instrumental methods, such as spectrophotometric, electro-analytical, and chroma-

tographic techniques. *Inorganic Chemistry* applies the principles of physical chemistry to a study of inorganic systems.

Depending on the type of curriculum, advanced work is also pursued in one or more of the following areas: inorganic chemistry, qualitative organic analysis, nuclear chemistry, chemical instrumentation, organic preparations, and introductory physical-organic chemistry.

The Department of Chemistry recognizes its responsibility to those students whose secondary school preparation has been exceptional and whose ability has been clearly demonstrated. For these gifted students, the Department offers a different and challenging curriculum during the first year aimed at enrichment rather than acceleration. During the second year, these students are taught in special recitation and laboratory sections of the regular course; in the senior year they may pursue independent study and research in the Graduation with Distinction program.

CIVIL ENGINEERING

(See Engineering Studies)

CLASSICAL STUDIES

Greek 1 (Fall), 2 (Spring), Course for Beginners

The purpose of this course in the elements of classical Greek is to provide the foundation for development of the ability to read Attic prose, and at the same time to give the beginning student an introduction to the importance of the achievements of the ancient Greeks and their contributions to modern civilization. The most common vocabulary and idioms in Greek are studied, and emphasis is placed on the syntactical usages most frequently encountered in Greek authors. To lend vitality to the study of grammar, selected passages from many notable Greek writers are read and analyzed. Also, in vocabulary study attention is given to English words derived from Greek.

Greek 15 (Fall or Spring) Mythology

Greek mythology introduces the student to the subject by stressing content while devoting some attention to sources, types, and analysis of the classical myths. Myth arises as man's imaginative response to facts of his experience in physical, social, and historical contexts. In consequence, myths form the seed of inspiration for the greatest works of Hellenic art and literature. These creative

influences of the myth inhere in surviving sculpture, painting, and poetry, and in their continuing power to stimulate more recent artists and poets. Greek 15 is offered as an elective for freshmen in either semester, and no knowledge of the Greek language is required.

Latin 1 (Fall), 2 (Spring), Course for Beginners
Latin 63 (Fall) Cicero's Orations, 64 (Spring) Vergil's Aeneid
Latin 91 (Fall), 92 (Spring), Latin Prose and Poetry

The beginning course provides the fundamental grammar and, toward the end of the year, the reading of some easy prose. In Latin 63, 64 the student will read some of Cicero's orations and part of Vergil's *Aeneid.* If he begins in 91-92, he will find himself reading selections from great writers of prose, such as Pliny or Sallust, and great poets, Catullus, Horace, and others.

The two more advanced courses purpose to introduce the student to masterpieces of one of the world's greatest literatures, and to develop and promote a capacity to read Latin with understanding, appreciation, and enjoyment.

The Major in Greek

The major in Greek is concerned with the literature and history of ancient Greece. All students take the same core of work. In the second year the student is introduced to two important classical authors, Herodotus and Xenophon. Selections from Herodotus on the causes of conflict between East and West illustrate his universal Hellenic curiosity and sympathy, and indicate the basis of his claim as the "Father of History." In the *Anabasis* by Xenophon the reader, as he follows the upland march of the 10,000 Greeks through the heart of the Persian Empire, glimpses something of the resourcefulness and indomitable spirit of the Hellenes. Also, he becomes acquainted with an incident decisive in the orientation of the Greek world eastward, and thereby in the birth of the Hellenistic Age. These readings are preceded by a grammatical review, and they are accompanied by further study of syntax and forms.

The third-year course serves the general function of increasing the student's knowledge of the Greek language and literature. The chief aim of the first semester's study, Books I-III of Homer's *Iliad,* is to show the greatness of the poetry of Homer. Emphasis is laid on the highly poetic character of his language; a closer acquaintance with his poetic usage is achieved by requiring the students to give Attic prose equivalents of the words and expressions that Homer

uses, with a view to showing how far above the level of prose Homer's language rises. Later the class uses Matthew Arnold's four essential characteristics of Homer's poetry as a basis for criticism, and with these as criteria tests the great poetic translations from Chapman to Bryant to determine which of the characteristics they possess and which they lack. Then the students in turn are called upon to write a verse-translation of a number of lines, and the same criticism is applied to their productions. The outcome of this method of study is a keener appreciation of the majesty and grandeur of Homer, and of the sublime heights of his poetry.

The work of the second semester is centered in the martyrdom of Socrates as described by Plato in his *Apology* and *Crito*. Special attention is given to vocabulary, forms, and syntax; and the literary aspects of Plato's writings are emphasized.

In the fourth year the student is familiarized with the dramatic poetry of the ancient Greeks. Introductory lectures on the origin and development of Greek drama (tragedy and comedy) are followed by a study of three typical masterpieces selected from the works of Euripides, Sophocles, and Aristophanes. In addition to translation, special emphasis is placed upon the assimilation, transformation, and reproduction of the thought of the authors into readable and idiomatic English. This develops literary sense as well as analytic ability. Attention is given to the influence of Greek drama on subsequent European literatures.

In addition work is given in Greek prose composition and in Greek history. The first of these courses seeks to impart a knowledge of the principles of language in general, and of the forms, vocabulary, and syntax of Greek in particular, and thereby to cultivate the student's memory and give him a clear conception of the exact relation of clauses to one another.

In the second course a survey of the origin and progress of civilization in the Greek world from the Late Bronze Age to the Macedonian conquest is presented. Throughout the course strong emphasis is laid on underlying causes and historical significance of events.

The Major in Latin

The major program in Latin involves the study of works of Latin authors, commencing with the "third-year" courses in Latin prose and poetry. Lower-level courses, primarily in the mechanics of the language and the development of reading ability, are taught with the purpose of eliminating, to the greatest possible extent, the obstacle

of a language which is not our own. The invention of writing gave to language, and the thought which it conveys, a life which the spoken word loses in the moment of speaking. A language "lives" then, not only in present utterance, but also wherever in reading it constitutes a bridge of communication. Latin is not generally in current spoken use, but a knowledge of the language, as the medium of expression, is prerequisite to full and satisfactory comprehension of the thought and literary achievement of the Romans as captured in their writing.

While it is certainly true that a command of Latin is beneficial to the speaker and reader of English, and while it may be that the discipline of the language is valuable in other application, the major importance of Latin lies in its use, as the instrument of expression, by some of the earliest, and still notable, thinkers of mankind. Western civilization draws its beginnings and early development from the ancients, and in the widespread sharing of their influence it has its principal bond of unity. Artists, philosophers, and men of letters have continually returned to this source and foundation; and the reëstablishment of communication with the ancients and their creations was the birth of that Reawakening which was to be a parent of the Modern World.

The major program leads into intimate acquaintance with several of the great literary monuments and their authors; the incomparable prose styles of Cicero in philosophy and rhetoric, of Tacitus in historiography; the powerful, mordant satire of Juvenal, the modern-sounding scientific thought and theory of Lucretius. As education, these studies, like those of other great literatures, or philosophy, or fine arts, are a substantial contribution to the individual's cultural development and personal enrichment. And as training they are by no means to be despised or ignored in these days when the spokesmen for industry, business, and the professions with unanimous accord continually emphasize to their prospective recruits the virtues and values preëminently of education in the liberal arts. This curriculum furnishes the intending teacher in the secondary schools with background and depth, and the student who goes on to graduate work in the Classics with the necessary foundation for advanced study.

ECONOMICS, BUSINESS ADMINISTRATION, AND ACCOUNTING

Economics 1 (Fall), 2 (Spring), Introduction to Economic Problems and Policies and the Evolution of Economic Ideas

Economics 1 aims to give the student an understanding of the present day American economy and the challenge to it from centrally planned economies. It considers the policies that are used or proposed to deal with problems of depression, inflation, growth, and automation.

Economics 2 is a study of man's economic activities and his ideas about them from the ancient world to the present day. Emphasis is given to the historical roots of present day economic ideologies.

Economics 57 (Fall), 58 (Spring), Principles of Accounting

These courses are open to freshmen who have achieved a score of 600 in both the verbal and mathematics sections of the SAT tests. The election of these courses in the freshman year by qualified freshmen is particularly valuable to students who intend to major in accounting.

Economics 57 provides a basic knowledge of accounting and a consideration of financial statements. Attention is focused on the nature and purpose of accounting, the measurement and classification of economic data, and accounting reports as a tool of management and the investor.

Economics 58 is concerned with the problems of accounting for and control of monetary assets and costs, the problems of capital stocks and the elementary problems of decision making. The relationship of the firm and national income accounts is examined.

The Majors in Economics, Business Administration, and Accounting

Three distinct programs of study are offered in this area. A student may major in economics, business administration, or accounting. Regardless of the major chosen, the student will be assured of a broad-guage education. The courses of study comprising these programs have been designed with a full awareness of the liberal arts tradition to which the University is committed. The Department feels strongly that its mission is not to train students for their first job after graduation but to instill those qualities of mind which will fit them for the responsibilities that will arise in their careers. Ex-

perience over the years has indicated that prospective employers prefer the broader background.

The general focus of the three majors in the Department is on the economic process—past, present, and future. Knowledge of this process is an important part of a liberal arts education. How society decides what to produce, how to produce, and who will enjoy the fruits of production in large part determines the nature of society, philosophically, socially and politically.

The major in economics is concerned with the economic process from a conceptual and analytical point of view and is especially recommended for those who intend to go on to graduate work in economics. It also provides an excellent background for students who intend to do further work in other social sciences, law, or history.

Business administration majors build on the same base but emphasize the process by which the firm makes decisions and plays its role in society. In the student's upper level studies, he is directed to courses which stress in greater measure knowledge and techniques useful in the preparation for a business career. The limited specialization required for a degree can be further enriched by the choice of elective business courses. Normally a student who intends to do graduate work in business is advised to choose the economics undergraduate major.

The major in accounting, while building on the same base, is more concerned with the analysis and presentation of data which arise from the firm's operations. These data enable the firm and society to act more effectively. Students who believe that accounting is their future vocation and who desire a more professional preparation may elect either the public accounting program, which prepares them for the Certified Public Accountants Examination, or the industrial accounting program.

In the senior year, majors in the department may pursue independent study leading to Graduation with Distinction.

EDUCATION

The Major in Education

The main purpose of the Department of Education is to provide professional preparation for teachers and other personnel for the schools. For this reason many of the courses offered by the Department are of primary interest to students who intend to teach. Such courses deal with principles and materials of instruction and

their application to the classroom. However, the Department offers several courses in the area of liberal education which will help in developing a better understanding of people and society. Most of the courses in social and psychological foundations of education are in this category.

At the undergraduate level, Duke University prepares teachers for both elementary and secondary schools. Prospective elementary-school teachers major in education, since in this way they may best meet the dual requirements of gaining knowledge and skill in all of the areas taught in elementary school and acquiring an understanding of child development and learning theory. The University prepares teachers for the secondary schools in the fields of art, English, foreign languages, physical education (women), mathematics, music, the sciences, and the social studies. Prospective secondary-school teachers major in the academic department of their principal interest and should choose related work which will strengthen their preparation for a teaching career. There is a special program in science education designed to provide a broad background in the sciences and mathematics.

Introductory Psychology is prerequisite to all programs in teacher education. This course provides an opportunity to develop a background for understanding the behavior of children and adolescents. It should be taken in the sophomore year. Social Foundations of American Education is also prerequisite to all programs in teacher education. It is intended to acquaint prospective teachers with underlying viewpoints, problems, and issues of education. It should be taken in the junior year.

Students preparing to teach devote an entire semester of their senior year to courses in designated subject matter and professional education, and to student teaching. During the last half of this semester they are engaged in full-time observation and student teaching in schools.

Advisers in the Department of Education will help in planning a program that will serve individual student needs. For example, each student's program must be designed to meet the requirements of the state or states in which he desires certification. Students may also be helped by their adviser to work toward a decision as to whether or not they should teach and, if so, what subject or grade.

Anyone planning to teach who majors in another department should also make an appointment with a Department of Education adviser prior to each registration period for the proper planning

of his program. Such a contact will insure that a place will be available in the student teaching program in the senior year.

In the senior year, majors may pursue work leading to Graduation with Distinction.

ENGINEERING STUDIES

(College of Engineering)

Engineering 1 (Fall), 2 (Spring), Engineering Design

These courses introduce the student to the "engineering process," both through learning the elements of engineering graphics—a form of communication and a tool for visualizing solutions to engineering problems—and through solving problems of engineering design. The problems are posed so that the student will gain some experience in drawing on his knowledge to devise logical solutions. Approximately two-thirds of each course is devoted to engineering graphics and one-third to engineering design problems.

The graphics presented in Engineering Design 1 include the language of graphics, the rules of orthographic projection, and drafting techniques. Most of the drawing is done in pencil, both freehand and with instruments. Short design problems are assigned to individuals or to small groups.

Engineering Design 2 continues graphical representation as applied to drawing-board geometry. Problems involving intersections and development of surfaces and the relationship of lines and planes are solved. Solutions are derived through application of orthographic principles acquired the first semester. Mathematical problems, charts, graphs, elementary nomography, graphical calculus, and other special problems are also offered. The problems are larger in scope than those in the first semester and involve larger design teams, the supposition of more realistic budgets, and closer attention to ultimate feasibility.

Majors in Engineering Studies

The ultimate purpose of engineering is to bring into being new devices, machines, processes, and structures, which contribute progressively to the development of civilization, and to do so at a reasonable cost in time and money. Central to this concept of engineering is that of *creativity.*

The unique contribution of the professional engineer, that of *feasible* and *creative design,* revolves around the effective putting together, or synthesis, of ideas and information relevant to the prob-

lem at hand. Characteristics of the engineering process are uniqueness or improved function, best possible use of people and materials, and practicality. Essential to the successful fulfillment of the engineering function are an adequate knowledge of both existing and new scientific information, an ability to combine this information effectively, an understanding of production processes and fabrication methods, and the exercise of professional responsibility for the welfare and protection of people.

Whereas engineers as individuals may perform specialized services within the total science-technology spectrum, it is the feasible, creative *design* concept which provides purpose, perspective, and incentive in engineering activity. Research and development, management, production, sales and services, and teaching are all important engineering activities as they occupy supporting roles to the central *creative* purpose of engineering.

It is essential to distinguish the aims of engineering from those of science. While these fields are closely interdependent, their objectives are fundamentally different. Science is involved in the *quest* for knowledge, engineering in its *use*. The scientist seeks to understand and describe clearly and rigorously the laws which govern the behavior of the physical world. In contrast, the engineer seeks to devise a practical solution to a human need and must make many compromises and judgments of value in doing so. His use of science and mathematics is an important means to this end.

The dependency of engineering on mathematics and science has increased greatly in recent years and promises to continue to grow. For this reason the engineer needs a strong background in mathematics and science so that he may use knowledge from these areas effectively.

The educational program in engineering at Duke is directed toward the following four objectives:

1. To produce engineers who are equipped to function at the highest professional level, not only today, but for several decades, regardless of the scientific advances that the future may bring. To meet this objective, the program seeks to provide a fundamental understanding both of the *science of engineering,* which is based on mathematics and the physical sciences, and of the *art of engineering,* which depends on human imagination and judgment.
2. To produce engineers who can function intelligently within the economic and social framework of our culture—persons who are able to look from the past through the present into

the future in terms of material wants and needs, and who are able to organize the human effort and financial resources necessary to provide the machines, goods, structures, and services that will meet those needs and wants.

3. To produce engineers who recognize their responsibilities as citizens of their communities.
4. To produce engineers who seek to continue aesthetic, ethical, intellectual, and spiritual growth.

The first of the four objectives is served primarily by the required and elective courses in mathematics, chemistry, physics, and engineering; the last three objectives, mainly by the required and elective courses in the humanities and the social studies. All four objectives are served by various aspects of the extra-curricular program, including those of the general university program.

A prime requirement for successful practice of engineering is the ability to communicate facts and ideas. The engineer must be able to listen and read and to speak and write with precision, clarity, and understanding. Consequently, certain courses designed to improve the ability to communicate are required, and effective graphical representation, writing, and speaking is expected in all course work.

Each of the following majors offers a program of honor work leading to Graduation with Distinction.

Civil Engineering

The concern of the civil engineer is primarily with conception, design, and construction although often his responsibility includes management and maintenance. While the scope of his profession is very broad, its work may be classified into five major fields. These are *hydraulics:* flood control, river and harbor improvements, irrigation, drainage, and water power; *land utilization:* development of communities, industrial sites, and existing cities; *sanitary engineering:* public health, water supply, and waste disposal; *structures:* bridges, foundations, dams, tunnels, tanks, thin shells, and missile structures; *transportation:* railroads, highways, air ports, waterways, pipelines, and traffic control.

Electrical Engineering

The profession of electrical engineering utilizes the electrical and magnetic forces of nature and the properties of matter to supply human needs. Because electricity is the most flexible form of energy

available to man, electrical engineering influences the living of most of the world's population. This profession is concerned with the *processing and transmitting of information*—as in television, radar, radio, electronic measurement, and computation. It is equally concerned with the *processing, transmitting, and controlling of energy*—as in rotating machines, power systems, and automatic industrial processes. It provides most of our labor-saving home appliances and many of the instruments of modern scientific research and of modern medical practice.

Mechanical Engineering

Mechanical engineering includes the design, development, operation and maintenance of all types of machines; the designing of power plants and factories, the selection and installation of their equipment; the development of systems of operation; and the organization and administration of plants and industries.

The mechanical engineer is concerned with development, design, manufacture, and operation of prime movers, such as steam, gas, and hydraulic turbines, internal combustion engines, and to an increasing degree in the production and utilization of nuclear energy; of equipment for the transmission of power from the prime movers to the power-using machinery; of the power-using devices, such as pumps, compressors, propellers, airplanes, missiles, ships, trains, automobiles, electrically-driven mechanisms, chemical process equipment; of indicating instruments, regulators, and of equipment for guidance, automatic and manual control. The mechanical engineer is heavily involved with the design and control of rockets, missiles, and spacecraft.

Mechanical engineers are employed in industries such as aeronautics, missile, space vehicle, automotive, ship construction, manufacturing, process, air conditioning, refrigeration, heating and ventilating, petroleum, plastics, wood, textile, power, fuel, nuclear engineering, and in industrial research and testing.

ENGLISH

English 1 (Fall), 2 (Spring), Freshman Composition

Several years ago the University revamped its system of teaching freshman composition. Here briefly are the features of the course. (1) The reading in English 1-2 is drawn from the writers in England and America of this century because such writing is closest

to the interests and experiences of the young men and women of this generation. Once a week in a general lecture the reading assignments are discussed by some qualified member of the Department, often one of the senior professors. This lecture is the starting point for a discussion of the reading in the classroom, in the conference, and among the students themselves. (2) Besides the general lecture, the student each week attends one meeting of his class (or section), made up of about eighteen members. Here his own instructor directs a discussion of the week's reading or talks about those problems of composition which are pertinent to his students. (3) Most problems of composition, however, are individual, and so it is in the weekly tutorial conference that the student is likely to receive his most valuable assistance. In the conference, the instructor reads, discusses, and grades the weekly theme. The student not only is given the reasoning behind the grade imposed upon his theme, but he also has a chance to explain his own position and to find out ways of improving his work. It is here especially that the student realizes that he is not an anonymous member of a crowd; instead, the whole course is focused on him and is designed for his individual benefit.

Through these varied approaches each freshman, then, receives the advantages of the three historic modes of instruction: the formal lecture, the group discussion, and the private conference.

Freshman English is an enterprise which involves not the English Department alone but in some ways the whole college community. For example, the Duke Players annually present one of the plays assigned in the course; thus the freshman may read the play, discuss it in class, hear a lecture on it, and then see it acted. Within the freshman class, a sense of intellectual kinship is created by the common readings. Actually, since the readings are largely those read by the preceding class, the undergraduates as a whole share a body of literary knowledge that can be used for informal discussion or for helpful reference by instructors in other courses throughout the University.

Special Writing Section of English 1, 2

All Duke freshmen, except those who have passed the Advanced Placement examination, will take English 1 and 2. There is, however, one section given for those who have shown a particular aptitude for descriptive and narrative prose and who wish to undergo a further rigorous training in these types of writing. A final selec-

tion will be made during Freshman Week by Mr. Reynolds Price, the instructor, after a further qualifying test.

Please take note that the regular sections of English 1 and 2 with their training in expository writing are more suitable for most students, however great their ability; the special section is not reserved for "high-scorers," for students with higher scores may be found in the regular sections. Students who have taken the Advanced Placement examination in English and who are interested in narrative writing may apply for this section and if they receive a passing AP score, may then decide whether to take the qualifying test for the special section or to enroll in a sophomore course.

English 51 (Fall or Spring), Public Speaking

The ability to express oneself orally is a valuable asset to anyone, and is a necessity for those going into the professions of law and the ministry. English 51 is designed to develop this skill and to give the student the poise and confidence necessary to think and speak freely before an audience. Particular attention is paid to the gathering and organization of materials.

The Major in English

The study of literature is, and will always be, one of the broadest avenues to a liberal education. It holds wide opportunities to approach and synthesize the whole length and breadth of human knowledge and to deal, directly or indirectly, with the great minds of the past and present. These are, essentially, very "practical" functions just as, at the other pole, to study literature is to gain insight into the very practical art of communicating through the written word. But perhaps most of man's conscious activity takes place neither on a high metaphysical plane nor on the level of the daily job; on the middle plane where he often lives and acts, literature holds the finest resource for understanding human character and all its complexities, for acquiring a sensitivy to the human condition and its workable values. Finally, everyone has to some degree an aesthetic drive: the study of literature gives it depth, direction, and rich satisfaction.

The student choosing a major in English concentrates in the study of English and American literature. The English Department has a varied program of offerings, and the major is required to satisfy a pattern of distribution rather than to take specific courses. As a result, the major will find his academic program marked by flexibility and individual responsibility. Usually he will be able to follow his preferences within a wide range of English and American literature and can also take two or more courses in some restricted

area such as Elizabethan drama or nineteenth-century English literature or contemporary fiction, poetry, and drama.

The size and diversity of the Department also give him unusual freedom in the choice of his teachers. If he is wise, he will exploit the opportunity to select teachers who have differing approaches to literature and to classroom methods. He has, furthermore, a wide freedom in his program of related work, though he is helped in his planning by the member of the Department who acts as his academic adviser.

Opportunities for creative expression are found in the *Archive* (the campus literary magazine), in the *Chronicle* (the newspaper), and in student groups devoted to speech, debate, and the drama. The Anne Flexner Memorial Award in Creative Writing is also given annually.

The Department poses some formal challenges to the more able student. In addition to the regular and traditional courses in literature, composition, speech, and drama, the English Department has instituted a number of upper-level "Conference Courses," limited to twelve students in each, for close study of various aspects of literature. A special Senior Seminar is offered majors who are candidates for "Graduation with Distinction in English." This seminar stresses independent reading and the writing of a critical research paper. The Department also offers to every major in his senior year the opportunity to enter any among a dozen courses that are primarily designed for graduate students and that introduce him to a more technical and critical approach than he will usually meet in the conventional undergraduate program.

FRENCH

(See Romance Languages)

GEOLOGY

Geology 51 (Fall), 52 (Spring), General Geology

[Although students normally begin work in the department in the sophomore year, these courses are open to freshmen with SAT verbal and mathematics scores averaging 600 or higher.]

Geology 51, 52 offers a broad survey of the hard rock crust of the Earth and its softer mantle of debris and soil on which life depends. The first course deals with the forces which build up, change, and destroy the accumulated formations that make mountains, underlie the sea bottom and ocean basins, and floor valleys—

the forces of wind and weather, running water and moving ice—and the underground forces of volcanism and diastrophism. Lectures are supported by the examination of common minerals and rocks in the laboratory and by the study of topographic maps. In the second semester the broad aspects of the physical history of the Earth and the evolution of life forms is studied. Basic principles used in reconstruction of the sequence of geologic events and the relative dating of these events is emphasized. The close interplay between the physical and biological history of the earth is stressed and possible causes and the significance of major trends and events is examined in terms of our knowledge of present day physio-chemical and biological processes.

The Major in Geology

Geology is the physical science concerned with the study of the earth. Some of the interests of geologists are the physical processes acting on the earth's surface (water, wind, ice), the composition of the earth (rocks and minerals), its structure (continents, ocean basins, mountains), its economic products (oil, gravel, water, uranium), and its past history (origin, shifting positions of land and sea, kinds of life present).

Men and women versed in geology are utilized by federal and state governments and industry to help solve such varied problems as the location of petroleum deposits or the nature of the moon's surface. A considerable number of geologists are engaged in a wide spectrum of research in such specialties as oceanography, seismology, volcanology, and astrogeology.

The basic training of a geologist following the introductory survey courses is in four fields: (1) minerals (2) rocks (3) stratigraphy (4) structure. Additional courses depend in part on the specialization desired by the student. Basic training extends beyond geology alone and into other sciences: physics, chemistry, biology, and the mathematics. Fundamental principles and knowledge from all of these sciences is likely to be used in one specialty or another within the broad framework of geology. In some instances study in depth will be necessary within a related science for the student to be trained in a specialized field of geology. Thus the paleontologist must be trained in biology and the mineralogist in chemistry.

Undergraduates are encouraged to assist and in some cases to become junior partners in the various staff research activities.

GERMAN

German 1 (Fall), 2 (Spring), Elementary German
German 63 (Fall), 64 (Spring), Intermediate German

"Elementary German" obviously must concentrate on grammar and structural language tools, adding as much reading of illustrative material as time allows. "Intermediate German," on the other hand, is chiefly concerned with reading (short stories, poems, etc.) combined with certain necessary grammar review. The facilities of the language laboratory are particularly designed for students in both of the first two years of German. Laboratory exercises are aimed at sharpening auditory comprehension, increasing fluency, and raising the general level of student language performance.

The Major in German

Germany and German-speaking countries have contributed many men of genius in a wide variety of fields: poetry, the novel, philosophy, music, medicine, psychology, and most of the natural sciences. A study of the German language is obviously a desirable and even required tool for opening up their achievements in these varied areas. Moreover, the United States in the last eighteen years has renewed her cultural, political and economic ties with Western Germany and Austria. This association is apparently destined to remain close for decades to come. A firsthand acquaintance with the German language, with the literature and social background of the Germanic countries, is therefore valuable and, in some cases, indispensable both to the future specialist and to the well rounded liberal arts student. Germany, even though divided, is still a major state of central Europe. Knowledge of its language, culture, and civilization is essential for knowledge of the history and culture of modern Europe, and of Western civilization.

A German major is required to take eight semester courses in the Department beyond the intermediate level. In the early stages of study, language-laboratory facilities are of assistance; this approach is being increasingly emphasized in the work of the first two years. The German major is also asked to choose several courses among the various humanities, i.e., other literature courses, including English or American or Comparative Literature, French, Spanish and Russian literature as well as suitable courses in philosophy, history, religion, and linguistics. Study in these areas rounds out a liberal education.

The aim of the Department is to place language and literature study within the framework of Germanic civilization and European

culture in general. The poets and writers of world influence (Goethe, Schiller, Hölderlin, Heine and the modern figures of Rilke and Thomas Mann) are seen against the background of great musicians of Austrian and German birth (Bach, Mozart, Beethoven, Schubert, Schumann, Brahms) as well as the achievements of their greatest, most influential thinkers (Kant, Schopenhauer, Nietzsche).

What are the benefits of such a major? The purely cultural benefits cannot easily be summarized. Just as Goethe and Kant, Nietzsche, Mann, and Rilke have made significant contributions to world culture, so the figure of Goethe's Faust stands beside Hamlet and Don Quixote as one of the great figures in Western literature.

Beyond its contribution to a liberal arts education, this major leads into teaching (at all levels: elementary, high-school, college, and university) and toward the government's Foreign Service as well as into such channels, potentially, as the export and import trade with German-speaking countries (Germany, Austria, and Switzerland).

The department offers an honors program leading to Graduation with Distinction.

GREEK

(See Classical Studies)

HISTORY

History 1 (Fall), 2 (Spring), Modern History

Aware that almost every student who enrolls in Duke University will have had courses in history, the History Department has attempted to provide a course for freshmen which will be instructive and interesting not only to those students who have had little or no history, but also to those who have studied history for several years. The subject matter of Modern History offers a student an opportunity to understand better how his own society has developed. It also helps him to appreciate present day problems in a way which the study of the past alone can supply. For example, the course emphasizes themes which are just as vital to an understanding of our own problems as they were to those of almost every century in the past. These themes are (1) the rise of the national states and the conflict between liberty and authority within them; (2) the problems of peace and war among these states; (3) the economic practice and theories of modern times, especially the way in which capitalism has changed through the years; (4) the faiths and ideologies men live and die by.

Although a firm understanding of the way in which these themes developed is obviously of importance, equally important for the college student is the ability to evaluate critically historical writings and interpretations and to draw conclusions himself from the sources from which history is written. Consequently, considerable emphasis is placed upon encouraging the student to think critically and upon training in the techniques of historical investigation.

History 1x (Fall), 2x (Spring)

History 1x-2x is designed as a seminar-type course for students who have had a good background in European history, who can read and comprehend rather large amounts of historical material in a semester, and who are capable of examining historical problems with a minimum of attention to historical chronology. The Department determines those who are qualified by consideration of SAT verbal scores, completion of three units of high school history, and an interview with the student. Students who have earned a score of two or higher on the Advanced Placement Examination in American history may also be admitted to the course.

The class will meet less frequently than the regular freshman sections, and each section of 1x-2x will number approximately twelve to fourteen students. Class discussions will be on readings assigned during the previous period, and debates may be arranged between members of the class on various topics. Various collections of source materials, pamphlets, paperback books, and articles dealing with some of the leading personalities and the major issues in history will be used during the semester. Semester projects in the form of written papers will be required. Short papers—critiques, book reviews, and essays—will also be assigned during the term.

The Major in History

History seeks to develop insights into a particular body of human activity whether it be revolution in Russia, dictatorship in Napoleonic France, or the building of empires in the New World. To impart these insights courses in history strive to cultivate far-ranging minds and the kind of trained intellects that delight in pursuing a line of research or developing a good argument. As worthy components of a liberal education these courses espouse the view that the unexamined life it not worth living and the unexamined world is not worth living in.

At Duke a major in history is planned to allow students almost complete freedom in choosing their courses within the framework of

the University philosophy of undergraduate education. Normally all majors are required to take an introductory course in Modern History. In their remaining semesters of history, majors have considerable freedom of choice. The single mandatory stipulation is that two courses must be in an advanced seminar or on the senior-graduate level so that every student will have at least some opportunity for intensive investigation on a subject in an area of special interest. Beyond the work in history, the department urges majors in the department to broaden their understanding by exploring widely in the various disciplines other than history. The latitude provided within these requirements is perhaps best suggested by the increasing number of pre-medical students now majoring in history.

The History Department is in a position to offer an unusually wide range of subjects to prospective students, since all the fields offered by the Department are open to undergraduates. These fields are American (including Diplomatic, Colonial, 19th Century, 20th Century, the South, Civil War and Reconstruction, and Intellectual history), Western European (including Ancient and Medieval, the Renaissance, the French Revolution, 19th and 20th Century), English history and the British Commonwealth, Russian, Latin American, Indian and Pakistani, Far Eastern, Military, and Naval history as well as the history of science.

In addition to the individual courses offered in the various fields, the History Department has introduced a special program of seminars with enrollment limited to no more than a dozen in each to encourage students who are interested in doing advanced reading and research. Specially qualified students may also do independent reading and research under the supervision of a member of the staff. A "Senior Seminar," is provided for superior students, particularly those working toward "Graduation with Distinction in History." But whether one qualifies for "Distinction" or not, a major in history should help prepare a thoughtful student to enter the many occupations in life which are open to graduates of a liberal arts college.

LATIN

(See Classical Studies)

MATHEMATICS

Mathematics 17 (Fall) Introduction to Finite Mathematics
18 (Spring) Elementary Statistics

Mathematics 17 introduces students, early in their college career, to several concepts in modern mathematics. The first topics covered

are close to students' experience, and the whole range comprises elementary logic, sets, vectors and matrices, and probability theory. Applications to problems arising in the biological, physical, and social sciences are stressed. In contrast to calculus, which deals with infinite sets and limiting processes, this course deals with finite sets of objects. Many of the most profound problems in mathematics are finite in character.

Mathematics 18 gives a brief but clear presentation of statistics as an applied mathematical subject. This course aims to develop both an appreciation for and an understanding of the basic ideas and methods of statistics. Topics studied include the summation of data, means and standard deviation, normal, binomial and other distributions, sampling, statistical estimation, and testing hypotheses.

Mathematics 17 and 18 are primarily designed for students who do not intend to major in a science.

Mathematics 21 (Fall), 22 (Spring), Introductory Calculus

A revised curriculum in mathematics has recently been introduced. In offering it the Department of Mathematics believes that the new course sequences will do much to meet the need for more and more mathematics felt by research workers in scientific fields.

Most students will begin their mathematical training with the course entitled Introductory Calculus. The concept of a function will be introduced, and trigonometric, logarithmic, and exponential functions will be given special attention. Graphs and applications of such functions will form a basic part of this course. In the section on plane analytic geometry, the equations of straight lines, circles, parabolas, ellipses, and hyperbolas will be derived and properties of these curves will be studied.

In another part of the course the concepts of the calculus will be taught. The discussion of many of the types of motion that are of interest, e.g., the motion of molecules in a gas, the flight of an airplane, and the flight of a rocket require ideas that form the basic part of calculus. The calculus concepts also enable one to find the lengths of curves, surface areas, and the volumes of irregularly-shaped solids. In this course students will be given the tools and calculus concepts that will enable them to solve many of the above-mentioned types of problems.

For the small group of freshmen who will need some review work before entering the calculus courses, the University offers a one-semester course entitled Algebra and Trigonometry, Mathematics 11.

Mathematics 41 (Fall), 42 (Spring)

For students who have demonstrated marked proficiency in mathematics the Department offers special courses. In these the topics of Mathematics 21, 22 are covered in a more extensive and rigorous fashion.

Candidates for the special sections must present four units of college preparatory mathematics and SAT verbal and mathematical test scores of 725 or above.

The Major in Mathematics

Knowledge of the areas encompassed by mathematics and what this "science" has to offer can be gained from a discussion of its three main branches: algebra, geometry, and analysis. The division known as algebra stemmed from arithmetic and now includes such fields as abstract algebra, group theory, and number theory. The algebra to which students are introduced in high school is a powerful tool for solving certain types of problems, but it is only one of the many types of algebra. Some of these various abstract algebras have found applications in the physical and social sciences.

The second branch of mathematics, geometry, had its origins in the space apperception of primitive man. The Greeks, combining space concepts with logical and abstract reasoning, developed a postulation or axiomatic system known as the Elements of Euclid. The Arabs added trigonometry to the field of geometry, and the French philosopher Descartes introduced the notion of coordinates, which permitted algebra to enter into the study of geometry. Differential geometry, which arose during the eighteenth century, played an important role in the development of Einstein's theory of general relativity. The first half of the nineteenth century saw the development of several non-Euclidean geometries. The newest subfield of geometry is that of topology. It treats those aspects of figures which do not change under deformation. This newest member of the geometry family came into being at the turn of this century and in the short time since its inception, has engulfed all classical geometries and has had a marked influence in many other areas of mathematics, as well as in such unrelated fields as medicine and psychology.

The third branch of mathematics is called analysis; it was initiated by Leibnitz and Newton towards the end of the seventeenth century. Here a new basic concept in mathematics was added, that of a limit. This has been one of the most fruitful concepts of man; e.g., we use it in rate problems and in finding the volumes of irregular bodies.

Many, many developments in chemistry, physics, and other sciences can be traced directly or indirectly to the notion of a limit. A few of the subfields of analysis are calculus, real and complex function theory, differential equations, infinite series, and measure and integration theory.

The student selecting mathematics as a major can concentrate in any one of the three branches just mentioned, or he can select those courses in each branch which appeal to his own particular interests. To these fields should be added the field known as applied mathematics which is playing an increasingly important role in scientific and technological developments. The applied mathematician is interested in the development of mathematics for its own sake as well as in the application of mathematical methods in such fields as engineering, physics, economics, and management. The student interested in applied mathematics should elect courses in analysis, computing, probability, statistics, and mathematical logic. He should also have a strong interest in a related field such as physics or economics.

In the senior year, a major may pursue independent study leading to Graduation with Distinction.

MECHANICAL ENGINEERING

(See Engineering Studies)

MUSIC

Music 1 (Fall), 2 (Spring), Introduction to Music

Music 1-2 is designed for the general student who wishes to investigate the cultural heritage of musical literature. It provides a technique for perceptive listening by using the elements of rhythm, melody, instrumental color, and form as a basis for stylistic and critical analysis of masterpieces of music in all media, with reference to their social and historical functions. No musical skills are prerequisite.

Music 65 (Fall), 66 (Spring), Theory

This course introduces the study sequence leading to a major in music. It deals with (1) the comprehension of those basic melodic, rhythmic and harmonic techniques upon which Western music is based; (2) the application of these techniques in written exercises and short original compositions with emphasis upon both

the linear and harmonic aspects; and (3) the sharpening of skills involving ear training, sight singing, and keyboard harmony.

The course is a composite lecture-discussion-laboratory presentation taught by the theory staff. It is by no means limited to music majors but it does presuppose an acquaintance with musical symbols.

Music 47 (Fall), 48 (Spring), Applied Music

Private instruction from artist-teachers is available in voice, piano, organ, and orchestral instruments. A course of study may be continued for four years and should lead the student through the establishment of a secure technical foundation and into a serious study of the interpretation of musical styles and literature. Prospective music majors should begin this work in the freshman year. General students with previous study backgrounds are also welcome in it.

The Major in Music

The study of music is usually approached through one of three different divisions of the field. Each of these may be considered a "specialization," but a balanced knowledge of all three is essential to the training of a fine musician. These branches are (a) musical performance, (b) musical theory and composition, and (c) music history and musicology.

In order to achieve highest competence in *musical performance* a solid background of technical discipline within a specified medium (for example, piano, violin, or flute) is necessary. This discipline can best be established in the early years and should be well developed at the time of college entrance. At whatever stage one decides upon the study of music, however, the acquaintance and technical mastery of an instrument is essential to the development of musical understanding. This should not be postponed.

The study of *musical theory* encompasses a thorough investigation of the styles and technical resources utilized in compositions which represent the continuity of musical development in Western civilization. Those which are still experimental and which may constitute bases for the art of the future are also studied. The student is encouraged to work with this material in original constructions.

Music history and *musicology* are branches of general historical study. The manifestations of a civilization in terms of its culture are as revealing as those of its politics. This field is not restricted to the prospective professional musician. Courses which cut across various historical periods and which consider music within the con-

text of sociological, economic, and geographic milieu are designed for general students.

The Department offers honors work leading to Graduation with Distinction.

NAVAL SCIENCE

Naval Science 101 (Fall) Naval Orientation

This fall course presents an introduction to the organization of the Navy, including the background and usage of naval regulations, customs and courtesies, and shipboard duties. The characteristics, missions, and capabilities of basic types of naval vessels in carrier, air, surface, undersea, and amphibious operations are studied along with naval terminology, deck seamanship, naval formations, and maneuvers.

Naval Science 102 (Spring) Naval History and Seapower

This course considers the role of seapower from the age of galley warfare to the present, with emphasis on the modern period beginning with the rise of Britain as a world power. The impact of seapower on the rise of world powers is considered as well as its role in peace and war. By studying tactics and strategy of the past the student is challenged to interpret the influence of seapower on world history past, present, and future.

Naval Science Studies

Students already accepted in the Naval Reserve Officers' Training Corps, or those contemplating enrollment in the NROTC after arriving on campus, should indicate Naval Science 101 when writing their programs of study. By becoming a member of the NROTC, male students are eligible to compete for Navy scholarships that provide full tuition, fees, books and $50 per month retainer pay, plus the opportunity to participate in summer cruises with fleet surface and air units in Atlantic and European waters.

NURSING

(School of Nursing)

Nursing 1 (Fall), 2 (Spring), Interpersonal Relations In Nursing

This is an introductory course in nursing and is prerequisite to all courses in clinical nursing. The student is introduced to basic

concepts of human behavior as related to stages of growth, personality structure, and basic needs within the current situation. Emphasis is placed on learning techniques of observation, communication, and interviewing. Laboratory experiences are provided so that students may learn to apply these concepts and develop their skills of observation and communication.

Program in Nursing

The faculty of the School of Nursing believes that the student who seeks admission to the School comes with the intent to be a professional nurse; therefore, the program is designed to aid in confirming her intention by offering a curriculum balanced in courses from the liberal arts, the sciences, nursing, and carefully planned experiences in a professional milieu.

The freshman year is devoted largely to the study of liberal arts and basic science courses. Introduction to nursing begins with the study of interpersonal relations which is extended throughout the entire program. The sophomore year is initiated by a formal Capping Service and the wearing of the distinctive student nurse uniform. It is in this second year that the student begins to feel like a nurse, for the focus is on the Fundamentals of Nursing, a course which is integrated with the biological and social sciences courses included in her program.

In both the junior and senior years the emphasis of the program is in learning the theories and mastering their application in carefully selected laboratory assignments in the Duke University Medical Center and other health agencies in Durham. In the junior year the four major nursing specialties, pediatrics, obstetrics, medical, and surgical nursing are studied intensively. In the senior year, the student gains a knowledge of psychiatric and public health nursing and in the area of medical-surgical nursing there is the focus on learning principles of administration, teaching, and supervision of members of the nursing team.

This basic program in nursing is designed to prepare its graduates as professional nurses for beginning positions in nursing as well as to provide the foundation for masters' programs. The graduates of the basic program are eligible to write the examinations for licensure administered by the North Carolina Board of Nursing.

PHILOSOPHY

Philosophy 41 (Fall), 42 (Spring), Knowledge, Fact, and Value

These courses provide an introduction to philosophy through the study of its main problems. Philosophy 41 is concerned with the nature of truth and fact, evidence, faith, and knowledge, and with the nature of the fundamental categories, ultimately descriptive of the universe. It is, then, an introduction to theories of the nature and kind of knowledge man can attain and to some major metaphysical theories about the nature of the universe of which he has knowledge.

Where Philosophy 41 deals in general with knowledge and fact, Philosophy 42 deals with value. In particular, it provides an introduction to the problems that arise out of the evaluation of actions as right or wrong, good or evil, reasonable or unreasonable. It inquires into the grounds for these evaluations and also seeks to give a systematic and general account of the nature of the concepts used in evaluation and their interrelations.

Both these courses usually involve a certain amount of reading in the philosophical classics. In Philosophy 42, for example, students may read from the works of such writers as Plato, Kant, and Mill, though no attempt is made at a comprehensive treatment of the history of philosophy. In these courses, students with a talent for abstract reasoning tend to do well; others have to work to develop this ability. Philosophy 41 and Philosophy 42 may be taken in either order.

Philosophy 48 (Fall or Spring) Logic

Philosophy 48 deals with the analysis and evaluation of reasoned arguments. It provides a general method for formulating and testing the validity of many different types of argument. The course also aims at making the student sensitive to alternate interpretations that may be put on an argument, and aware of the part played by ambiguity and vagueness.

The student learns to use some of the techniques of modern symbolic logic and gains some sense of what is meant by rigor in formulation and proof, and of the nature of formal sciences.

The Major in Philosophy

Philosophy grows out of a group of questions and issues that are as old as our civilization. Most intelligent persons have pondered them at some times in their lives. What sort of universe do

we live in? Is it mental, physical, or both? Does it have some over-all purpose or plan? And what about man? Is there some purpose or meaning in life? Does man have free will or is his behavior determined? The philosopher seeks to answer these questions or, failing that, at least to understand them.

Gradually, there have arisen divisions, or major areas in philosophy, each of which can be studied in some isolation from the others. For example, questions of free will may raise questions about the nature of caused behavior, the nature of motivation, of choosing, of intending, and of thinking. These issues form a separate area which we call philosophy of mind. Again, the question of what our aims and purposes are or should be raises further questions which belong to the discipline we call ethics, which investigates such topics as the nature of moral standards, how they are established and justified, and with the analysis of such concepts as "good," "ought," and "right."

Philosophers in trying to answer these questions have found themselves raising in turn such questions as: How do we establish the truth of what we say? How do we test our beliefs? What constitutes good evidence? What is the differences between knowing and merely believing? This area in philosophy is called the theory of knowledge or epistemology.

When we offer answers to our questions, or offer the solution of a problem, we try to give reasons for our answers. We try to justify and show the soundness of our conclusions. The study of this activity is logic, a branch of the theory of knowledge. Logic deals among other things with the nature of arguments, the differences between sound and unsound reasoning. Out of it grows the investigation into the ways in which general principles or laws are established in the sciences, which we call inductive logic. Related to this is the study of the ways in which conclusions are established in legal arguments, in art criticism, and in evaluation.

Philosophy is old, inasmuch as philosophers have been working with these problems since the dawn of civilization. And yet philosophy is always new, since succeeding centuries encounter new problems and discover new ways of approaching the old. In the twentieth century, philosophy has discovered a new vantage point from which to examine its problems, that of the study of language, and the relations between language, thought and the world. Viewed from this new standpoint, many of the traditional issues can be seen clearly in a way that never was possible before. And yet the contemporary emphasis on language, which reaches into nearly every

corner of philosophy, gives rise to new and special problems of its own, which are studied in formal logic, semantics and the philosophy of language.

Here then are a few of the major areas in philosophy. Within them one can find subordinate and related studies such as philosophy of science, philosophy of art, philosophy of law, and philosophy of religion.

This brief sketch cannot do more than suggest the way in which the parts of philosophy grow out of and sometimes discard earlier parts; new issues, new fields develop in philosophy. Philosophy, moreover, is one of the few subjects which studies its own history. Part of the study of philosophy is the history of philosophy, that is, the study of what the great philosophers of the past, Plato, Aristotle, Aquinas, Kant, and Hume, to name a few, had to say on the fundamental issues, and, in fact, which issues they regarded as fundamental. Ancient philosophy is not outmoded because it is ancient any more than ancient art is outmoded.

Philosophy is self-conscious in a way that other disciplines are not. For it seeks a total view of things and in trying to answer its questions, it turns and investigates its own methods and techniques in giving answers. The philosopher, as it were, is always trying to look over his own shoulder to see what he is doing. In this awkward posture, he advances as best he can against the multitude of problems that beset him, while at the same time wrestling with the question "What is Philosophy?", perhaps the most difficult question of all. It will not then be surprising to learn that philosophy has always been controversial; despite large areas of agreement, there are many issues on which philosophers differ widely.

The major in philosophy offers an opportunity to study most of the areas within the discipline. It does not, in itself, lead directly to any career except teaching. But students planning a career in other areas will often major in philosophy because they wish to avoid specializing too soon, or because they recognize the general value of philosophic study in becoming aware of the methods, assumptions and goals of whatever field one works in, and because philosophy, by stressing this broad vision, contributes to the development of cultured and thoughtful individuals. Knowledge of philosophy has always been considered as part of the necessary equipment of any educated person.

In the senior year, a major may pursue independent study leading to Graduation with Distinction.

PHYSICAL EDUCATION

Physical Education (Men) 1 (Fall), 2 (Spring), Foundation of Physical Education

In this program an attempt is made to present the "why" and "how" of physical activity to male freshmen. During the first two class meetings, students are given a general orientation to the total program as well as the following battery of tests: agility run, vertical jump, back extension and flexion, hand grip strength, height and weight measures, swimming test, and posture pictures. These scores are recorded on a master score card on which percentile norms have been indicated. This card is used for reference throughout the semester, and for recording future types of tests relating to muscular endurance, balance, coordination, heart efficiency, and the like.

Following the preliminary test pattern, students are divided into three groups. While the first group is involved in swimming, the second group does a unit on orientation to sports activities such as golf, tennis, handball, and badminton, and the third group is involved in a unit on foundation of physical activity which includes training techniques and interpretive information concerning health and fitness. Each group then rotates with the others so that all students spend an equal amount of time in each of the three phases of the program during the term.

Through this program students are made more aware of their body types and their physical potentials. Furthermore, they learn how they can most effectively meet their present and future physical needs, and they are given guidance for future selection of activities.

The second semester of the freshman year is devoted to large muscle developmental activities including gymnastics, swimming and wrestling.

In each semester of his sophomore year, the student is guided into one of the following sports: basketball-handball, golf, swimming and life saving, tennis, volleyball, gymnastics, individual development.

Students who are physically limited may take a medically prescribed program of adapted physical education.

Physical Education (Women) 1 (Fall), 2 (Spring), Foundations of Physical Education

Through the required physical education classes, each student becomes aware of her own potentialities and needs in efficient move-

ment; she gains an understanding of the importance of exercise as a part of effective living in adult years; she has the opportunity to improve present skills and to gain the satisfaction that comes from learning new ones; and she has a broader understanding of the place of sports and dance in American culture. This learning takes place during the classwork of the first two years, through election from a wide variety of offerings in the areas of sports, dance, and aquatics, and through reading, discussion, and written tests.

Because of the wide range of physical education abilities among entering freshmen, a series of placement tests is given during Freshman Week followed by individual interviews. Freshmen with specific needs in rhythm, posture, sport skills, and swimming take special classes during the first half of the semester. Others elect activities such as hockey, tennis, badminton, swimming, golf, riding, and modern dance. During the winter activities include bowling, badminton, swimming, fencing, volleyball, basketball, and several types of dance. Courses are divided into beginning, intermediate, and advanced sections, and each student registers in the section which corresponds to her ability.

The Major in Health and Physical Education

(The Woman's College)

Physical education in some form is universal. It is inherently interesting to children of all ages and to most adults. It is a broad field covering many aspects of motor activity, such as sports, aquatics, gymnastics, the many forms of dance, and recreational activities.

To assure that positive good may result from programs of physical education, trained leaders are necessary. The major program in physical education in the Woman's College has as its purpose the developing of teachers whose understanding of human needs and behavior and whose knowledge of basic theory as well as skill in performance make them worthy leaders of youth.

The courses in the major program fall into three main categories: principles, methods and materials, and biological science. In studying the history and principles of physical education, the student discovers the part that physical education has played from the early Greek civilizations to the present time. She learns the place of sports, dance, aquatics, and gymnastics in American and European cultures of today. She studies the activity needs and interests of children of different ages and becomes familiar with the laws of learning as applied to the learning of movement skills. Problems of administration in

school physical education, program planning, health, and safety are some of the topics studied in other theory courses.

The courses in methods and materials are directed primarily to the teaching of physical education in secondary schools, although teachers of other subjects or students in sociology and religious education find certain of these courses valuable as related work.

A strong background of biological science is also necessary for the major. A course in mammalian anatomy gives students an understanding of all the organ systems and emphasizes particularly the nervous, muscular, and skeletal systems of the human body. In kinesiology human movement is studied. Students review the mechanical principles which apply to human motion and discover the characteristics of movement essential to development of skill and conservation of energy. Physiology is included in order that students may understand the body functions as a basis for healthful living, and may engage in or lead activity with awareness of the effects of exercise on the human mechanism.

In addition, the major needs a broad general education. Courses in written and spoken English, literature, art, music, psychology, and sociology are especially desirable. The broader her educational background and her understanding of people, the more valuable she becomes as a leader and teacher.

It is well for the student interested in the physical education major to indicate that interest early so that she may have ample time to take the prerequisite and required work in proper sequence.

PHYSICS

Physics 1 (Fall), 2 (Spring), Introductory Physics
Physics 41 (Fall), 42 (Spring), General Physics

The Department of Physics offers two different courses at the introductory level. These courses are of comparable scope and both are open to freshmen. Physics 1-2 is primarily for those students who do not intend to major in science. A good preparation in algebra is required, but not necessarily in trigonometry. Physics 41-42 is designed for science majors, engineers, pre-medical students, and others who wish to elect it. Introductory Calculus must be taken prior to or concurrently with Physics 41-42.

In scope the introductory courses include the study of mechanics, heat, optics, acoustics, electricity and magnetism, and atomic and nuclear physics. As examples, the concepts dealt with in two of these fields can profitably be given in more detail. In mechanics

one considers such things as forces and accelerated motion, mechanical energy, and the conservation laws for momentum and energy, rotational and planetary motion, oscillatory motion, and gravitation. Again, in electricity and magnetism, which are taken up together because of their close relationship to one another, the properties of electric and magnetic fields produced by stationary and moving charges, the forces on electric charges in electric fields and on currents in magnetic fields, and direct and alternating current curcuits are studied.

The Major in Physics

Physics has been recognized more and more as one of the most absorbing subjects in the natural sciences. Many of the most important discoveries in this century have been in the field of physics. In the last decade for instance, the study of elementary particles and the invention of the MASER have had far reaching effects on our basic knowledge of matter. The study of semiconductors that led to the invention of the transistor has greatly increased our insight into the nature of crystalline solids and has also resulted in a breakthrough for the electronics industry. The rapid development of physics in the last decade has shown the need for more physicists in basic physics, in applied physics, and in the teaching profession.

The Department offers a full program for a major. The sequence of courses is usually introductory physics, intermediate mechanics and electricity, electronics, kinetic theory of gases and thermodynamics, advanced laboratory, electromagnetic theory and physical optics, and atomic and nuclear physics. The undergraduate does not specialize in a given field of physics, but receives an extensive training in the several basic areas. This prepares him for graduate work in physics or work in other sciences and in engineering.

Senior majors who have demonstrated their ability in course work and in the laboratory can pursue independent research and study in a program leading toward Graduation with Distinction. At all levels there exists the opportunity to become aware of the nature of the research being carried out in the fields of nuclear physics, particle physics, the study of the structure of molecules and solids using both microwave and optical techniques, the properties of matter at temperatures approaching absolute zero, and theoretical physics.

Physics majors usually "minor" in mathematics, and are also

expected to take a course in college chemistry, with a recommendation that additional work in chemistry be taken. As a whole, the work elected by the undergraduate major provides a desirably broad liberal arts base. This background is especially important for the person planning to become a professional physicist since he will soon become specialized.

POLITICAL SCIENCE

Political Science 11 (Fall), 12 (Spring), American and European Political Systems

Political Science 11-12 provides an introduction to the principles and practices of modern government, especially those of the United States, Great Britain, France, and the Soviet Union. The first semester, devoted largely to American government, considers such topics as: constitutionalism and the ways of restricting political power; means of achieving effective relationships between the President and the Congress; ways of making bureaucracy responsive and responsible; the influences of parties and pressure groups; federalism in theory and practice; the judicial function, with special attention to U. S. Supreme Court decisions involving freedom of speech, freedom of religion, equal protection of the laws and related issues of personal liberty; and a selected number of issues in the arena of domestic and foreign policy. The second semester is concerned primarily with European governments and seeks not merely to describe their institutional structure and political practice, but to contrast one with the other and all with the American form of government. The purpose of these comparisons is to delineate the essential characteristics of constitutionalism (whether of the presidential or parliamentary form) and of totalitarianism.

Political Science 11x (Fall), 12x (Spring)

These sections are open to freshmen who have high SAT verbal scores and whose academic record and special interest in the subject matter of the course give promise of superior performance. The sections are limited in enrollment, emphasize class discussion, and concentrate upon a more intensive examination of a selected number of contemporary political problems and issues.

The Major in Political Science

The Department of Political Science seeks to convey an understanding of the philosophies, practices, and problems of government

and politics. Political science is concerned with the perennial effort to reconcile the claims of justice and power, liberty and authority. In pursuing this broad objective a variety of materials and approaches are used: historical, legal, institutional, philosophical and empirical. As a consequence, political science is a broadly-based social science, one sharing the aims of a liberal arts education as well as one evoking concern for an understanding of the public policy problems of our time. Although of benefit to those students seeking a broad, liberal education, the study of political science is likely to be of special usefulness to those interested in a career in law, business, journalism, teaching, government employment, and public relations.

The student majoring in political science begins with a course in American and European Political Systems. Although it is desirable for the student to elect course work in each of the three broad areas described below, he is given maximum opportunity to develop a departmental program suited to his own needs and interests.

In the area of *Political Theory and Comparative Government* courses are offered in political philosophy from Plato to modern times and in the governments of Europe, Asia, Africa, Latin America, and the Middle East. In the field of *American Government and Public Administration* attention is focused upon problems of constitutional law, civil liberties, the bureaucracy, governmental planning, metropolitan areas, and state government. Also emphasized are the less formal aspects of political activity, including political parties, voting behavior, pressure groups, and the process of decision-making. In the area of *International Law and Relations* the student may select from among courses concerned with international politics, organization, and law.

In all three areas attention is given to problems relevant to contemporary concerns, such as a comparison of democratic and totalitarian theories and practices, the politics of mature and underdeveloped nations, the relationships among various levels of government, controversial public policies in the domestic and foreign areas, the meaning of liberty, and the relationships of law and power both domestically and in the international arena.

A senior seminar open to qualified majors leads to the preparation of an honors thesis and to Graduation with Distinction.

PSYCHOLOGY

Psychology 91 (Spring) Introductory Psychology

This course is open to freshmen in the spring semester.

Psychology is the field of study which seeks by scientific methods to describe, understand, and predict the behavior of living organisms. Psychology 91 attempts to give the student an overview of that science. The course content includes such diverse areas as the nature of scientific method; experimentation and quantification as applied to the study of behavior; intelligence and the factors influencing it; the basis for learning, perception, sensation, and motivation; the nature of personality—its manifestations and origins; and social and abnormal behavior. Considerable attention is given to the experimental literature and its relevance to the development of a theory of behavior.

The Major in Psychology

Over the last half century the field of psychology has undergone an enormous expansion, stimulated in large measure by the demonstrated practical value of psychology in a variety of areas of application. Intelligence testing, human engineering, public opinion polling, career counseling, motivational research, market surveys, and clinical interviewing all depend to some extent upon basic psychological knowledge.

Although these applications of psychology are important and interesting, it must be recognized that they *are* applications, that is, they draw upon the essential substance of psychology discovered in studies of general experimental psychology. Because of the widespread availability in the popular press of information on applied psychology, many beginning students do not have this idea, and are surprised when they discover in the introductory course that psychology does not deal primarily with applications to industry, mental health, academic adjustment, or with occult phenomena, but rather with a set of general scientific principles and the methods by which these principles are established.

In keeping with the importance of general experimental psychology, the psychology major at Duke University is designed to make sure that a student becomes acquainted with this basic field. This emphasis begins in the introductory course. In Introductory Psychology, he studies a series of standard topics which provide him with a survey of the materials which later courses cover in more

detail. A student who enjoys the beginning course will probably find the major in psychology exciting.

Beyond the introductory course the student who majors in psychology is required to complete seven semester courses in psychology, including a one semester course in statistics. The courses not covered by specific requirements may be selected from such offerings as biological psychology, child psychology, tests and measurements, applied psychology, and social psychology.

For the major student who is interested and capable, the Psychology Department offers several opportunities for intensive contacts with faculty members. Certain intermediate-level courses entail the completion of a project, which involves experimental work. At more advanced levels a flexible tutorial program (featuring small group discussions) is available. Finally, there are two series of courses which allow the student to do independent study and research. One of these sequences leads to Graduation with Distinction in psychology.

RELIGION

Religion 1 (Fall), 2 (Spring), The English Bible

Religion 1-2 is a comprehensive study of the Bible, including the reading and discussion of the most important parts of the Old and New Testaments. Study of the biblical texts themselves is the primary emphasis of the course, but this enterprise requires considerable reading of selected biblical scholarship of various kinds. Some classes employ short analytical essays and occasional research papers as aids to learning. The complexity of biblical materials and the great mass of significant scholarship in the field make this course a demanding and stimulating one.

Inasmuch as the Bible contains the primary literatures of the basic religious traditions of the West, this course, conceived as a humanities study, is of indispensable significance for a liberal education. A major aim of the course is to help a student, through a creative apprehension of the past, to become aware of the crucial role played by biblical religion in forming the expectations of the Western mind.

The Bible is studied as intellectual history, in which the literatures are examined in the light of their origins in the history and religion of biblical times. While each professor emphasizes to some degree his special interests and enthusiasms, he is sensitive to the varied religious backgrounds of his students and attempts to present the

Bible in the best scholarly traditions of historical, critical, and phenomenological analysis. A major goal of the course is to make intelligible in the present something that has been significant in the past, with a view toward discovering whether it has continuing relevance.

Religion 1x (Fall), 2x (Spring)

The department also offers advanced sections for those freshmen who score significantly high on the SAT verbal and English achievement tests. These special sections are limited in size in certain meetings each week and give more opportunity for active discussion and participation by students. Individual study is encouraged in order that students may pursue their particular interests. These sections are intended to attract students of high verbal ability who have some personal interest in biblical studies and who would welcome a course in which student initiative plays a greater role than is usually the case.

The Major in Religion

The Department of Religion represents a program of studies which is considered integral to a liberal education. While the existence of a vigorous and distinctive program of studies in religion at Duke is largely to be explained historically by the relationship of the university to the Church, the present emphasis is upon the study of religion as an element of liberal culture and as one of the humanities. A clear distinction is made between the study of religion (the role of the Department of Religion) and the practice of it (the role of the Chapel and other campus ministries). Recognizing that confusion at this point has contributed to a situation that has driven the study of religion from the curriculum of many American universities and isolated the practice of religion from the main stream of university life, the Department is committed to historical, critical, and phenomenological methods of study which sustain its role as one of the humanities.

But this approach does not mean that some narrow "scientific" or "historical" viewpoint is adopted. Rather, studies in religion, like those in any of the other humanities, develop according to the content of the subject matter, the personality, training, and proclivities of the teacher, and the receptivity of the student. The study of religion is approached as intellectual history, in which the professor seeks to exhibit in his sources certain expressions or modes of man's inner life and some of his deepest experiences. The teacher intends

to show with imagination and sensitivity how a particular vision of life or system of thought looks from the inside, and in this process to open for himself and his students new possibilities for the understanding of human life. That is, the emphasis is upon a continuing creative apprehension of the past, as the past addresses itself to the present and anticipates the future. As in the case of literature, art, music, philosophy, and history, the study of religion lends itself to the possibility that something can be learned for the enlargement of the minds and lives of men.

Based upon concrete thinking about matters of cultural, academic, and religous importance, our curriculum is fixed upon the premise that the central force in the culture of which we are a product is, and has been, without doubt, Christianity. Hence the first objective of the study of religion is an understanding of Christianity. But this leads to the sources, or the primary literatures of the Old and New Testaments. The program of study begins for all students at this point, and expands into five areas of further study: 1) Biblical Studies; 2) History of Religions; 3) Church History; 4) Theology and Ethics; 5) Christianity and Culture. Every major in religion participates through class study or directed readings and examinations in all of these areas, though he also emphasizes his special interest in one field.

A major in religion would therefore be a live option for students whose vocational aim is law, medicine, scholarship and teaching in religion, the various ministries of the Church, and many types of governmental and social service. It would also be an intelligent major for a student, not yet vocationally committed, whose concern in selecting a major is to assure a liberal education in the humanities tradition.

The program of studies in religion is designed to give coherence and structure to the work of majors, while also allowing majors and others maximum opportunity for accelerated study and personal achievement. The following facts are worthy of attention: (1) a 1 s.h. course (Religion 100), designed to help a student explore research techniques, is required of all majors and open to other students; (2) qualified juniors and seniors are encouraged to pursue independent reading with the possibility of earning substantial credit in this manner; (3) well-qualified majors, who aspire to Graduation with Distinction, are invited to participate in an independent study program beginning normally in the junior year; and (4) Senior Seminars, dealing intensively with a selected topic, are open to all qualified students.

ROMANCE LANGUAGES

French 1 (Fall), 2 (Spring), Elementary French
Spanish 1 (Fall), 2 (Spring), Elementary Spanish

French 1-2 and Spanish 1-2 offer an intensive aural-oral introduction to the language, followed by careful reading of edited texts. In each of these courses the recitation is supplemented by regular laboratory listening sessions.

French 63 (Fall), 64 (Spring), Intermediate French
Spanish 63 (Fall), 64 (Spring), Intermediate Spanish

French (Spanish) 63-64 is an integrated course in speaking, reading, and writing. There is a systematic review of the basic grammar and an extended reading program. Frequent listening periods in the laboratory are a regular part of the course.

French 91 (Fall), 92 (Spring), Introduction to French Literature
Spanish 91 (Fall), 92 (Spring), Introduction to Spanish Literature

French (Spanish) 91, 92 is designed to acquaint the student with the great personalities and the dominant styles and modes of thought which constitute the literary tradition of each country. The student utilizes as an instrument of literary study the language skills which he has acquired in basic courses: he reads to comprehend the thought of the writer and to appreciate the qualities of his expression; he hears his teacher explain and comment in French or Spanish on the texts; he is encouraged to express in the language his own understanding of what he has read.

The Major in French or Spanish

When a student elects to concentrate in French or Spanish, he has decided to study at some depth two important aspects of a particular culture: the language and the literature. At Duke, if he majors in one of these Romance languages, several courses in oral or written French or Spanish will extend and strengthen the skills of speaking and reading French or Spanish. He will devote the greater portion of his time and effort to the study of the national literature. Proficiency in the use of the language skills will therefore provide him with insights and appreciation of the literary works. The French or Spanish major will obtain a complete experience of the literature of his specialty by a judicious choice of courses ranging over the whole field of the literature. It goes without saying that this

contact with the literary masterpieces will create appreciation of and sympathy for the people whose literature he is studying.

We believe, however, that the study of a national literature must be made within the perspective of the humanities and history. We therefore try to balance the major program by incorporating into it related study in history, philosophy, fine arts, and other literature.

A man or woman who majors in the humanities is by definition attempting to understand "man" and to prepare himself for an intelligent adjustment to the society of his fellow men. In deciding to concentrate in one or more foreign languages he can work toward this goal and also prepare himself for a possible career in government, industry, foreign commerce, and, of course, teaching.

Students majoring in Romance languages will find regular extra-class activities which put the practical knowledge of the languages to use. There are honorary societies and informal supper meetings of language groups where conversation is carried on in French or Spanish. Every year students present a French play. There is a French Corridor and a Spanish Corridor on the campus of the Woman's College, under the direction of resident native French and Spanish women, where the students pledge to use the French or Spanish language exclusively.

An opportunity for the experience of foreign study is offered through the Duke summer study program in Strasbourg, France and Santiago de Compostela, Spain. Students may also take advantage of Junior Year Abroad programs of other colleges and universities.

In the junior and senior years, especially qualified students may pursue independent study leading to Graduation with Distinction.

RUSSIAN

Russian 1 (Fall), 2 (Spring), Introduction to the Russian Language

This course introduces the structure of the Russian language. The main objective is to familiarize the student with those features of Russian—its inflectional nature and verbal aspects—that are likely to seem strange to one accustomed to speaking English. Minor difficulties such as pronunciation, stress, and spelling, are given attention along the way. At the end of the course the student should have a reasonably clear idea of the Russian language, he should be able to understand the structure of the everyday expressions he has learned, and he should be able to read simple prose with the aid of a dictionary.

Russian 63 (Fall), 64 (Spring), Intermediate Russian Language

The chief goals of this course are those of acquiring the basic vocabulary needed to express ideas in Russian, increasing reading speed with the aid of a dictionary, gaining practice in sight reading, and oral practice. The last is especially valuable since it encourages thinking in Russian rather than translating thoughts from English into Russian.

The Major in Russian

Like the more traditional language majors, the major in Russian emphasizes the study of culture, literature, and history as well as language. Both pre- and post-revolutionary Russia are, of course, included in these studies.

Today the reasons why an American should study Russian and the Russian people are more compelling than ever. In recent years the Soviet Union has dramatically and irrevocably emerged as a young, vigorous, and aggressive world power. The need for persons with a command of the Russian language, and with training in some aspect of Soviet life, or the ability to view a recognized discipline against Soviet backgrounds, is widely recognized. Russian is a language in which a critical shortage of experts exists; and the establishment of preferential government grants for those students who pursue graduate studies in Russian attests to this fact.

Moreover, Russian is the mother tongue of over 100 million people. It is also the administrative language of the Soviet Union. Hence, it is an acquired language for another 100 million non-Russian citizens of the USSR and can serve to unlock the world of other groups within the Soviet Union. These peoples include the Slavic minorities such as the Ukrainians and the non-Slavic members like the Georgians and the peoples of Siberia. Russian is the only bridge between the latter groups and the outside world.

In addition to these immediate needs for learning Russian, sight is not lost of the importance of earlier Russian contributions to the culture of our time. Classical Russian literature of the nineteenth century, with such names as Pushkin, Dostoevsky and Tolstoy, has a place alongside the great periods of flowering of Western and Eastern culture. Other Russian contributions in linguistics, literary theory, and history are just now beginning to be appreciated.

Russian studies present a challenge, but one well worth the effort. While it must be admitted that Russian is a difficult language, none

of its difficulties is insurmountable. Of great help is the fact that Russian is an Indo-European language and has formal categories and a basic syntax little different from those of other members of the Indo-European family like Latin and English. As the student of Russian probes more deeply into his field he will also be struck by the similarities between Russian culture and the culture of the Western world, similarities that are often obscured by superficial differences. He will be equally impressed by the often deep differences lying under apparently similar and analogous institutions. It is the mark of the expert to be able to distinguish between them.

The purpose of the Russian major may then be summarized as the development of persons who, as a result of a thorough and scholarly study of the Russian language and Soviet institutions, have the foundation on which to build the further knowledge so necessary to those whose role will be to understand the Russian world and to interpret this world to their own countrymen.

SOCIOLOGY

Sociology 91 (Fall or Spring)
Introduction to Sociology: Concepts and Procedures

This course will emphasize the basic concepts and procedures employed in understanding social organization, social function, and social process. These areas will be subdivided into status, power, and social class; the integration and malintegration of social systems; and social interaction and social change, respectively. Special attention will also be paid to the various *levels* of sociological analysis—individual, group, societal, and cultural—and their relationships to one another. Conceptual approaches will be illustrated by the use of material from demography, collective behavior, human ecology, criminology, and studies of the family and other specific institutions.

Sociology 91 seeks to provide a general approach to the understanding of collective life and a set of conceptual tools useful in more advanced study.

Sociology 91x (Fall)

A special section is offered for the freshman student who is considering a major in sociology or one of the social sciences and for those especially interested in the study of human behavior. Candidates with high SAT scores who enroll in Sociology 91 will be invited to participate in this special section.

Sociology 92 (Spring)
Introduction to Sociology: Sociological Studies

This course will introduce the procedures of sociological inquiry through an examination of selected research monographs. Through this course the student should not only become acquainted with methods of framing and answering questions about social behavior, but he should also acquire an appreciation of the techniques of critical evaluation of sociological studies.

Class discussion of the research monographs will deal with questions such as: What is the main problem(s) with which the monograph is concerned? What theory and concepts are used to explore the problems? What kinds of data are brought to bear on the problem? What are the findings of the research? How adequate are the author's theory, concepts, and types of data for analysis of the problem? If he had used alternative theories, etc., would he have come out with the same conclusion? What general problems for further investigation are suggested by the study?

The Major in Sociology

Sociologists study the varied patterns and processes in the network of human relationships that we know as society. Their basic subject matter is human interaction, its form and content in groups, in communities, in organizations of various sorts. Wherever people are in communication with each other, whenever direct or indirect contacts occur, sociologists find possible materials for their research.

As one of the developing social sciences sociology is involved not only with description of human behavior, but also with its explanation. The search is for conditions that produce, maintain, and transform social life. Sociologists seek to develop general theories from carefully defined inquiries into areas such as juvenile delinquency, race relations, and mass communication.

Much of sociological research is a product of intellectual curiosity, a desire to comprehend the complexity and variability of facts and events. As such it enriches our understanding of the world in which we live.

In addition by clarifying the underlying nature of social problems, sociology may have its practical uses. The analysis of social situations and social trends provides a basis for prediction and possibilities for more effective planning and control. As man studies himself, and comes to know himself, there is promise that social problems, like physical and biological problems, will be brought to

intelligent solution. This is a challenge that is presented to those who pursue the study of sociology.

The Department of Sociology and Anthropology offers a varied program to undergraduates who wish to concentrate in the systematic study of human society. General courses introduce the student to the field of sociology and prepare him for more specialized study in areas such as industrial relations, the family, the city, race relations, mass communication, deviant behavior, and population. Other special areas of study include social stratification, social institutions, occupations and professions, the sociology of art, social attitudes, the life cycle, and collective behavior. These offerings in sociology are augmented by courses in the related field of anthropology, such as primitive religion, peoples of the world, language, and culture and personality.

As a further aid the Department provides its majors opportunities for training in the skills needed in sociological research. Courses are offered in methods of research, social statistics, and sociological theory. The Department also encourages undergraduate participation in research projects headed by staff members.

A special section of Sociology 91 is open to talented freshmen especially interested in the social sciences. For upperclassmen there are opportunities for independent study as well as for participation in the Department's Graduation with Distinction Program.

SPANISH

(See Romance Languages)

ZOOLOGY

Zoology 1 (Fall) Animal Biology
Zoology 2 (Spring) General Zoology

Zoology 1 deals with the structural and functional organization of the animal organism. Within this framework the basic properties of life, the cell, and the interrelated parts of the responsive animal are discussed. Special attention is given to the replication of the inheritable material, the differentiation of cells and the subsequent development of the new organism. During the course of these studies many techniques of modern research are introduced, and the important relationships of the other natural sciences and formal sciences to biology are illustrated. These aims are accomplished through a series of lectures and laboratory exercises.

During Zoology 2 emphasis is placed on the diversity of the animal kingdom. The structural characteristics of animals in each of the major taxonomic groups are studied, and the ways in which

the different structural organizations accomplish the basic functions of any animal are explored. Evolution, the origins of animal diversity, and ecology, the relationships of animals to their environments, are the coordinating principles of the semester. Other principles such as animal relationships, parasitism and commensalism, are also illustrated.

In this course a limited number of students who show special aptitude and interest are invited to participate in a non-credit seminar which meets in a faculty member's home. Outstanding scientists are invited to lecture informally to this group in various areas of modern biology.

The Major in Zoology

Zoology is the division of biology which deals with animals. As such, it shares the pervading atmosphere of excitement that characterizes modern biology. In the past decade the frontiers of biological research have been pushed so far forward that enthusiasts are predicting a "break-through" in biological knowledge comparable to that in atomic energy, with consequences which could be even more far-reaching.

The major in zoology reflects the nature of modern biology and is changed thereby. After the introductory course the student has a relatively free choice of courses appropriate to his interests and career plans. Other than the restriction that he must take one course in each of three areas, morphology, physiology, and genetics, any undergraduate or senior-graduate course in zoology may be counted toward the hours required for the major.

Many of the exciting recent advances in biological knowledge have come from the development of new techniques and the application of biochemistry, physical chemistry, physics, and mathematics to biological investigation. As a result, new areas such as biochemical genetics, biophysics, and molecular biology become largely interdisciplinary. A modern zoologist must obtain both competence and understanding through adequate training in the other sciences. A good major will thus include, *as a minimum,* introductory calculus, a year of physics, and chemistry through organic. Furthermore, a student who wishes to take more advanced courses than these in the natural sciences and mathematics may substitute up to 6 s.h. of them toward the major.

Opportunities for interested and qualified undergraduates to assist in staff research are available throughout the Department. In the senior year, majors may pursue independent study leading to Graduation with Distinction.

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For Bulletin of Information for Prospective Students, apply to *The Registrar,* Duke University, Durham, N. C., 27706.

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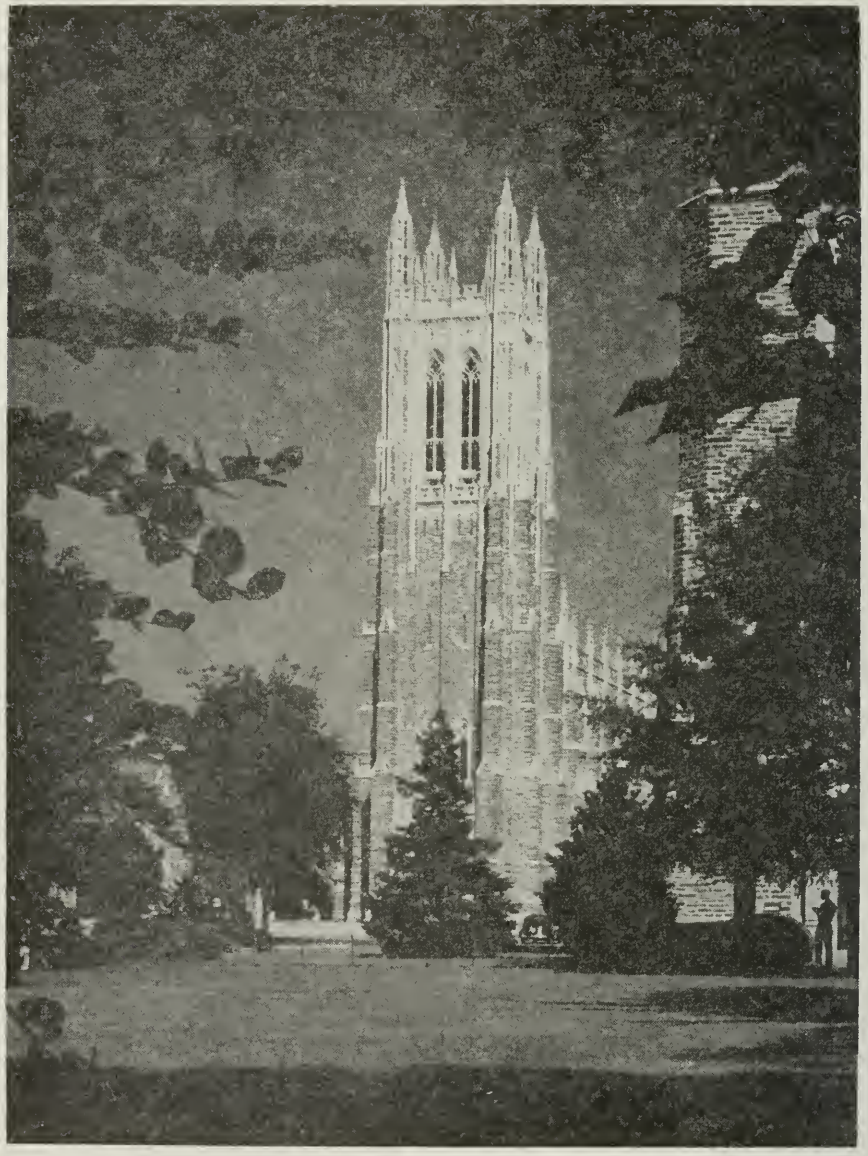
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THE CHAPEL

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OF

DUKE UNIVERSITY



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ANNOUNCEMENTS FOR 1965-1966

DURHAM, NORTH CAROLINA

1965

"I request . . . that great care and discrimination be exercised in admitting as students only those whose previous record shows a character, determination, and application evincing a wholesome and real ambition for life."

—James B. Duke.

Contents

Calendar of Colleges 7

History 8

Government 9

Officers of the University 18

The Undergraduate Colleges 79

The Divinity School 221

The School of Forestry 281

The Graduate School of Arts and Sciences 317

The School of Law 423

The School of Medicine 453

The School of Nursing 543

The Summer Session 589

Alumni Organizations 642

Gifts and Bequests 643

Degrees and Honors 645

Summary 662

Index 667

1965

JULY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

OCTOBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1966

JANUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

FEBRUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

MARCH

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MAY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

JULY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

AUGUST

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

SEPTEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

NOVEMBER

S	M	T	W	T	F	S
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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER

S	M	T	W	T	F	S
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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Calendar of the Colleges 1965-1966

1965

September	17	Friday, 7:30 p.m. Orientation begins: Assemblies for all new students entering Trinity College, the Woman's College, and the College of Engineering.
September	20	Monday. Registration and matriculation of all students of Trinity College, the Woman's College, and the College of Engineering, who have not pre-registered.
September	22	Wednesday. Final registration of pre-registered students. All students must report to their Dean's offices for class cards. (See page 33.)
September	23	Thursday. Fall semester classes begin.
November	6	Saturday. Last day for reporting six-weeks grades.
November	15-18	Pre-registration for Spring Semester 1966.
November	24	Wednesday, 12:30 p.m. Thanksgiving recess begins.
November	29	Monday, 8:00 a.m. Classes are resumed.
December	11	Saturday, Founders' Day.
December	18	Saturday, 12:30 p.m. Christmas recess begins.

1966

January	3	Monday, 8:00 a.m. Classes are resumed.
January	15	Saturday, 12:30 p.m. Fall semester classes end.
January	18	Tuesday. Final examinations begin.
January	28	Friday. Final examinations end.
February	1	Tuesday. Registration and matriculation of new students.
February	2	Wednesday. Last day for matriculation for the spring semester. All students must report to their Dean's offices for class cards. (See page 33.)
February	3	Thursday. Spring semester classes begin.
March	16	Wednesday. Last day for reporting six-weeks grades.
March	21-24	Pre-registration for Summer Session and Fall Semester 1966.
March	26	Saturday, 12:30 p.m. Spring recess begins.
April	4	Monday, 8:00 a.m. Classes are resumed.
May	19	Thursday, 5:00 p.m. Spring semester classes end.
May	21	Saturday. Final examinations begin.
June	1	Wednesday. Final examinations end.
June	4	Saturday. Commencement begins.
June	5	Sunday. Commencement Sermon.
June	6	Monday. Graduating Exercises.

History

DUKE UNIVERSITY is built about a group of colleges which have their roots deep in the past. It was founded more than one hundred years ago when a number of earnest citizens from Randolph and adjacent counties assembled in a log school house to organize an educational society. They wished to provide lasting support for the local academy founded a few months before by an energetic son of North Carolina, Brantley York.

Moved by "no small share of philanthropy and patriotism," these men set forth their belief "that ignorance and error are the bane not only of religious but also of civil society" and that they "rear up almost an impregnable wall between man and the happiness he so ardently pants after." On that basis they formally adopted a constitution for the Union Institute Society. Thus in February, 1839, the academy became Union Institute. Twelve years later the Institute was reorganized as Trinity College. In 1892 it was moved from the fields of Randolph County to the growing city of Durham. Thirty-two years later the College grew into Duke University. With increasing enrollment and the development of specialized needs the Woman's College was formed in 1925 and the College of Engineering in 1938.

As the University developed around the core of the colleges, the Graduate School of Arts and Sciences expanded in number of students and in areas of instruction and research; the School of Law of Trinity College became the Duke University School of Law; and other professional schools were established. The Divinity School was organized in 1926, the School of Medicine, and the School of Nursing in 1930, and the School of Forestry in 1938.

From academy to university the basic principles have remained constant. The University motto, *Eruditio et Religio,* reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation, and the church. Through changing generations of students the objective has been to encourage each individual to achieve to the extent of his capacities an understanding and appreciation of the world in which he lives, his relationship to it, his opportunities, and his responsibilities.

Government

I. THE INDENTURE OF TRUST BY WHICH THE UNIVERSITY WAS CREATED

Among the provisions of James B. Duke's Indenture of Trust was an educational institution to be known as Duke University, to the building and support of which he made provision at the time of execution of the Indenture and later by additions thereto by the operation of his Will. In respect to Duke University the Indenture contains the following provisions:

I. (In Article FOURTH) The Trustees hereunder are hereby authorized and directed to expend as soon as reasonably may be not exceeding Six Million Dollars of the corpus of this trust in establishing at a location to be selected by them within the State of North Carolina an institution of learning to be known as Duke University, for such purpose to acquire such land and erect and equip thereon such buildings according to such plans as the Trustees may in their judgment deem necessary and adopt and approve for the purpose to cause to be formed under the laws of such state as the Trustees may select for the purpose a corporation adequately empowered to own and operate such properties under the name of Duke University as an institution of learning according to the true intent hereof, and convey to such corporation when formed the said lands, buildings and equipment upon such terms and conditions as that such corporation may use the same only for such purposes of such university and upon the same ceasing to be so used then the same shall forthwith revert and belong to the Trustees of this trust as and become a part of the corpus of this trust for all the purposes thereof.

However, should the name of Trinity College, located at Durham, North Carolina, a body politic and incorporate, within three months from the date hereof (or such further time as the Trustees hereof may allow) be changed to Duke University, then, in lieu of the foregoing provisions of this division "FOURTH" of the Indenture as a memorial to his father, Washington Duke, who spent his life in Durham and whose gifts, together with those of Benjamin N. Duke, the brother of the party of the first part, and of other members of the Duke family, have so largely contributed toward making possible Trinity College at that place, he directs that the Trustees shall expend of the corpus of this trust as soon as reasonably may be a sum not exceeding Six Million Dollars in expanding and extending said University, acquiring and improving such lands, and erecting, removing, remodeling and equipping such buildings, according to such plans, as the Trustees may adopt and approve for such purpose to the end that said Duke University may eventually include Trinity College as its undergraduate department for men, a School of Religious Training, a School for Training Teachers, a School of Chemistry, a Law School, Co-ordinate College for Women, a School of Business Administration, a Graduate School of Arts and Sciences, a Medical School and an Engineering School, as and when funds are available.

II. (In Article FIFTH) Thirty-two per cent of said net amount not retained as aforesaid for addition to the corpus of this trust shall be paid to that Duke University for which expenditures of the corpus of the trust shall have been made by the Trustees under the "Fourth" division of this Indenture so long as its name shall be Duke University and it shall not be operated for private gain, to be utilized by its Board of Trustees, in defraying its administration and operating expenses, increasing and improving its facilities and equipment, the erection and

enlargement of buildings and the acquisition of additional acreage for it, adding to its endowment or in such other manner for it as the Board of Trustees of said institution may from time to time deem to be of its best interests, provided that in case such institutions shall incur any expense of liability beyond provisions already in sight to meet same, or in the judgment of the Trustees under this Indenture be not operated in a manner calculated to achieve the results intended hereby the Trustees under this Indenture may withhold the whole or any part of such percentage from said institution so long as such character of expense or liabilities or operation shall continue, such amounts so withheld to be in whole or in part either accumulated and applied to the purposes of such University in any future year or years, or utilized for the other objects of this Indenture, or added to the corpus of this trust for the purpose of increasing the principal of the trust estate, as the Trustees may determine.

III. (In Article SEVENTH) I have selected Duke University as one of the principal objects of this trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical, lines, is, next to religion, the greatest civilizing influence. I request that this institution secure for its officers, trustees, and faculty, men of such outstanding character, ability, and vision as will insure its attaining and maintaining a place of real leadership in the educational world, and that great care and discrimination be exercised in admitting as students only those previous records show a character, determination, and application evincing a wholesome and real ambition for life. And I advise that the courses at this institution be arranged, first, with special reference to the training of preachers, teachers, lawyers and physicians, because these are most in the public eye, and by precept and example can do most to uplift mankind, and second, to instruction in chemistry, economics, and history, especially the lives of the great of earth, because I believe that such subjects will most help to develop our resources, increase our wisdom and promote human happiness.

IV. (In Article THIRD) As respects any year or years and any purpose or purposes for which this trust is created (except the payments hereinafter directed to be made to Duke University) the Trustees in their uncontrolled discretion may withhold the whole or any part of said incomes, revenues and profits which would otherwise be distributed under the "Fifth" division hereof, and either (1) accumulate the whole or any part of the amount so withheld for expenditures (which the Trustees are hereby authorized to make thereof) for the same purpose in any future year or years, or (2) add the whole or any part of the amounts so withheld to the corpus or the trust, or (3) pay, apply and distribute the whole or any part of said amounts to and for the benefit of any one or more of the other purposes of this trust, or (4) pay, apply and distribute the whole or any part of said amounts to or for the benefit of any such like charitable, religious or educational purpose within the State of North Carolina or the State of South Carolina, or any such like charitable hospital purpose which shall be selected therefor by Trustees called for the purpose, complete authority and discretion in and for such selection and utilization being hereby given the Trustees in the premises.

2. THE CHARTER OF THE UNIVERSITY

SECTION 1. That A. P. Tyer, J. H. Southgate, B. N. Duke, G. A. Oglesby, V. Ballard, J. A. Long, J. F. Burton, J. N. Cole, F. A. Bishop, J. G. Brown, C. W. Toms, J. W. Alspaugh, W. R. Odell, J. A. Gray, F. Stikeleather, Kope Elias, S. B. Turrentine, P. H. Hanes, T. F. Marr, G. W. Flowers, M. A. Smith, R. H. Parker, W. J. Montgomery, F. M. Simmons, O. W. Carr, R. A. Mayer, N. M. Jurney, Dred Peacock, B. B. Nicholson, W. G. Bradsher, E. T. White, T. N. Ivey, J. B. Hurley, R. L. Durham, W. C. Wilson, and their associates and successors shall be, and continue as they have been, a body politic and corporate under the name and style of DUKE UNIVERSITY, and under such name and style shall have perpetual existence and are hereby invested with all the property and rights of property which now belong to the said corporation, and said corporation shall henceforth and perpetually, by the name and style of DUKE UNIVERSITY, hold and use

all the authority, privileges, and possessions it had or exercised under any former title and name, and be subject to all recognized legal liabilities and obligations now outstanding against such corporations

SEC. 2. That such corporation is authorized to receive and hold by gift, device, purchase or otherwise, property, real and personal, to be held for the use of said University and its dependent schools or for the use of either or both (as may be designated in the conveyance or will).

SEC. 3. That the Trustees shall be thirty-six in number of whom twelve shall be elected by the North Carolina Conference of the M. E. Church, South; twelve by the W. N. C. Conference of the said church; and twelve by the graduates of said University; *Provided*, however, That no person shall be elected a Trustee till he has first been recommended by a majority of the Trustees present at a regular meeting; and the Trustees shall have power to remove any member of their body who may remove beyond the boundary of the State or who may refuse or neglect to discharge the duties of a Trustee. The term of office of Trustees shall be six years, and they shall be so arranged that four Trustees shall be elected by each Conference and four by the graduates every two years. The Trustees shall regulate by bylaws the manner of election of Trustees to be chosen by the graduates. Should there exist a vacancy by death, resignation, or otherwise of any Trustee, the same shall be filled for the unexpired term by the Board of Trustees. That the present Trustees shall continue and remain in office during the term for which they have been heretofore respectively elected.

SEC. 4. That the said corporation shall be under the supervision, management and government of a president and such other persons as said Trustees may appoint; the said president, with the advice of other persons so appointed, shall from time to time make all needful rules and regulations for the internal government of said University and prescribe the preliminary examinations and terms and conditions on which pupils shall be received and instructed.

SEC. 5. That said Trustees shall have power to make such rules, regulations, bylaws not inconsistent with the Constitution of the United States and of this State, as may be necessary for the good government of said University and management of the property and funds of the same.

SEC. 6. That the Trustees shall have power to fix the time of holding their annual and other meetings, to elect a president and professors for said University, to appoint an executive committee to consist of not less than seven members, which committee shall control the internal regulations of said University and fix all salaries and emoluments, and to do all other things necessary for an institution of learning not inconsistent with the laws of this State and of the United States.

SEC. 7. That the Faculty and Trustees shall have the power of conferring such degrees and marks of honor as are conferred by colleges and universities generally; and that five Trustees shall be a quorum to transact business.

SEC. 8. That all laws and parts of laws or of the charter heretofore granted which are in conflict with this act are hereby repealed.

SEC. 9. That this act shall be in force from and after its ratification and acceptance by the Board of Trustees.

3. THE BYLAWS OF THE UNIVERSITY

ARTICLE I

AIMS

1. THE AIMS OF DUKE UNIVERSITY are to assert a faith in the eternal union of knowledge and religion set forth in the teachings and character of Jesus Christ, the Son of God; to advance learning in all lines of truth; to defend scholarship against all false notions and ideals; to develop a Christian love of freedom and truth; to promote a sincere spirit of tolerance; to discourage all partisan and sectarian strife; and to render the largest permanent service to the individual, the state, the nation, and the church. Unto these ends shall the affairs of this University always be administered.

ARTICLE II

BOARD OF TRUSTEES

1. POWERS. All powers of the University shall be vested in a Board of Trustees consisting of thirty-six members.

2. NOMINATION AND ELECTIONS. The Trustees shall be elected as follows, twelve by the North Carolina Conference of the Methodist Church; twelve by the Western North Carolina Conference of the Methodist Church; and twelve by the General Alumni Association of Duke University.

The Executive Committee, acting as a committee on nominations, shall report to the Board the names of the persons whom it nominates for election as Trustees. The Board, by majority vote of the Trustees present at a regular meeting, shall recommend the persons to be elected Trustees and submit its recommendations to the appropriate Conference of the Methodist Church and the General Alumni Association.

No person who shall have attained the age of seventy years shall be elected a Trustee.

3. TERM. The term of office of a Trustee shall be six years, beginning on the first day of January following the election, and the terms shall be so arranged that four Trustees shall be elected by each Conference and four by the General Alumni Association every two years.

4. VACANCIES. Any vacancy in the membership of the Board of Trustees shall be filled for the unexpired term by a majority vote of the Trustees present at a regular meeting of the Board.

5. RETIREMENT. A Trustee who attains or has attained the age of seventy years shall retire at the end of the term for which he has been elected.

6. EMERITUS. The Board of Trustees may elect a retiring or resigning Trustee a Trustee Emeritus. Trustees Emeriti shall be entitled to receive notice of all meetings of the Board and attend and participate in such meetings, but shall not have the right to vote.

7. REMOVAL. Any Trustee who may refuse or neglect to discharge the duties of Trustee may be removed by the affirmative vote of three-fourths of the members of the entire Board of Trustees.

ARTICLE III

MEETINGS OF THE BOARD

1. ANNUAL MEETING. The annual meeting of the Board of Trustees shall be held on the Saturday before the first Monday in June.

2. REGULAR MEETINGS. Regular meetings of the Board of Trustees shall be held on the first Friday in November and March.

3. SPECIAL MEETINGS. Special meetings shall be held upon the call of the Chairman, or upon written request of twelve or more Trustees addressed to the Secretary, with a copy to the Chairman specifying the business to be transacted at the meeting.

4. NOTICE. The Secretary shall give at least five days' notice to each member of the Board stating the time and place of all meetings, and the purpose of any special meeting.

5. PLACE. All meetings of the Board of Trustees shall be held at Duke University in the City of Durham, North Carolina, except that the Trustees by vote, or written assent, of a majority of the then members of the Board may designate another place for any meeting.

6. QUORUM. A majority of the then members of the Board of Trustees shall be a quorum for the transaction of business.

ARTICLE IV

OFFICERS OF THE BOARD

1. OFFICERS OF THE BOARD. The officers of the Board of Trustees shall be a Chairman, a Vice Chairman, and a Secretary.

2. ELECTION. The officers of the Board of Trustees shall be elected at its

annual meeting for a term of one year or until their successors are elected and qualified.

3. DUTIES.

a. The Chairman shall preside at all meetings of the Board, shall represent the Trustees at public meetings of the University, and shall be a member of and Chairman of the Executive Committee.

b. The Vice Chairman shall perform the duties of the Chairman in the absence or disability of the Chairman, or in the event of a vacancy in that office.

c. The Secretary of the University shall also be the Secretary of the Board of Trustees. He shall record the minutes of all meetings of the Board and its Executive Committee, and shall have custody of the Charter, Bylaws, minutes, records and other documents of the Board and its Committees. The Secretary shall send a copy of the minutes to each member of the Board promptly after each meeting of the Board and of the Executive Committee.

4. VACANCIES. A vacancy in any office of the Board of Trustees may be filled for the unexpired term by the Board of Trustees.

ARTICLE V

COMMITTEES OF THE BOARD

1. COMMITTEES. The Standing Committees of the Board shall be:

1. Executive Committee
2. Building and Grounds Committee
3. Committee for Institutional Advancement
4. University Committee.

The Board of Trustees may authorize other committees from time to time.

The Committees of the Board of Trustees shall have the powers and duties set forth in these Bylaws and such other powers and duties as the Board may delegate to them. They shall exercise their powers and perform their duties subject to the direction and approval of the Board. They may from time to time make recommendations to the Board for the establishment of new policies or any changes in existing policies.

2. MEMBERSHIP. At each annual meeting the Board of Trustees shall elect the members of the four Standing Committees to serve for the ensuing year. The Chairman of the Board of Trustees and the President of the University shall be members of the Executive Committee and shall be ex officio, non-voting members of all other Committees of the Board of Trustees.

Insofar as practical membership on the Standing Committees should be rotated.

3. VACANCIES. Any vacancy in the membership of a Standing Committees shall be filled by the Chairman of the Board of Trustees.

4. MEETINGS. Each Standing Committee shall meet at such times and places and upon such notice as it may determine, and shall file a copy of the minutes of each meeting with the Secretary of the University.

5. QUORUM. A majority of the then members of a Standing Committee shall be a quorum for the transaction of business.

ARTICLE VI

EXECUTIVE COMMITTEE

1. MEMBERSHIP. The Chairman of the Board, the President of the University, and not less than five Trustees shall constitute the Executive Committee of this Board.

2. POWERS AND DUTIES. The Executive Committee shall:

a. Control the internal regulations of the University.

b. Fix all salaries, emoluments, and other allowances.

c. Approve annual budget and authorize the annual audit.

d. Appoint an Investment Committee of not less than five members, at least two of whom shall be Trustees, with such powers and duties as may be assigned to it by the Executive Committee.

e. Subject to the provisions of the Charter and these By-Laws, exercise all powers of the Board of Trustees in the interims between meetings of the Board.
f. Report its actions to the Board of Trustees.
g. Act as the Nominating Committee for the election of Trustees.

ARTICLE VII

BUILDING AND GROUNDS COMMITTEE

1. MEMBERSHIP. The Building and Grounds Committee shall be composed of not less than five Trustees and the Vice President for Business and Finance ex officio.

2. POWERS AND DUTIES. The Building and Grounds Committee shall consider proposals by the President for:

a. Plans for the development and use of the University's buildings, grounds, and utilities devoted to educational purposes.
b. The kind, location and plans for all buildings, utilities and improvements, including roads and parking areas.
c. Architects and contractors.

The Committee shall have authority to accept all new construction on behalf of the University but shall not incur any expenses not previously authorized by the Board of Trustees or the Executive Committee.

The Committee shall report its findings and recommendations to the Board of Trustees or the Executive Committee.

ARTICLE VIII

COMMITTEE FOR INSTITUTIONAL ADVANCEMENT

1. MEMBERSHIP. The Committee for Institutional Advancement shall be composed of not less than five Trustees and the Vice President for Institutional Advancement ex officio.

2. POWERS AND DUTIES. The Committee for Institutional Advancement shall consider proposals by the President for policies and plans concerning the financial development, fund raising, public relations, and alumni affairs of the University.

The Committee shall report its findings and recommendations to the Board of Trustees or the Executive Committee.

ARTICLE IX

UNIVERSITY COMMITTEE

1. MEMBERSHIP. The University Committee shall be composed of not less than twelve Trustees and the Provost ex officio.

2. POWERS AND DUTIES. The University Committee shall:

a. Serve as a Board of Visitors to the University.
b. Serve as a Committee on Earned Degrees.
c. Consider proposals by the President for the educational role of each school, college, and unit of the University and for the University as a whole, the admission of students at all levels, student life and activities, educational and research programs, and the coordination of all educational activities.
d. Designate five of its members, who, along with an equal number of faculty members designated by the President, and the President ex officio, shall serve as a Committee on Honorary Degrees to make recommendations to the University Faculty and Board of Trustees.

The Committee shall report its findings and recommendations to the Board of Trustees or the Executive Committee.

ARTICLE X

OFFICERS OF THE UNIVERSITY

1. The Officers of the University shall be a President, a Provost, a Vice President for Business and Finance, a Vice President for Institutional Advancement,

one or more other Vice Presidents, a Treasurer, a Secretary, a University Counsel, and such other officers as the Board of Trustees may elect. One person may hold more than one office, except that the officers of President and Secretary may not be held by the same person.

2. These Officers shall be elected by the Board of Trustees at its annual meeting for a term of one year and shall serve until their successors are elected and have taken office.

3. A vacancy in any office of the University may be filled, for the unexpired term, by the Board of Trustees or by the Executive Committee.

ARTICLE XI

PRESIDENT

1. The President shall be the chief educational and administrative officer of the University. He shall be responsible to the Board of Trustees for the supervision, management, and government of the University, and for interpreting and carrying out the policies of the Board of Trustees. He shall have the powers and duties set forth in the Charter and in these Bylaws, and such other powers and duties as the Board of Trustees shall delegate to him.

2. He, or someone designated by him, shall preside at all academic functions and represent the University before the public.

3. He shall preside at all meetings of the University Faculty. He may veto any action taken by the University Faculty or any action taken by the faculty of any college or school in the University and state his reasons for such action.

4. He shall submit a proposed annual budget for the University to the Executive Committee prior to the beginning of the fiscal year covered by the budget.

5. He shall submit to the Board of Trustees an annual report on the condition, operations and needs of the University.

6. He shall recommend to the Board of Trustees persons to be officers of the University other than the President.

ARTICLE XII

PROVOST

1. The Provost shall be an executive officer of the University, under the President, responsible for all educational affairs and activities, including research and the University Hospital, and for all aspects of student activity and welfare. He shall have the powers and duties assigned to him by the President and shall report to the President.

2. He shall be a member of the faculty of each college and school, and ex officio a member of each committee (other than Committees of the Board of Trustees) or other body concerned with matters for which he is responsible.

3. He shall receive recommendations developed by the faculty and educational officers for consideration and recommendation to the President.

4. He shall assume the powers and duties of the President during the incapacity or absence of the President or in case of a vacancy in that office.

ARTICLE XIII

VICE PRESIDENT FOR BUSINESS AND FINANCE

1. The Vice President for Business and Finance shall be an executive officer, under the President, responsible for all business and finance, including accounting and auditing, preparation of budgets, fiscal planning, and operating of services of the University. He shall have the powers and duties assigned to him by the President and shall report to the President.

2. He shall have custody of all records, contracts, agreements, deeds, and other documents of the University or relating to its operations or properties, except minutes of meetings.

3. He shall submit to each regular meeting of the Executive Committee a report on those aspects of the finances of the University that the Executive Committee may require, and shall submit to the Board of Trustees at the end of each fiscal year on account of all receipts and disbursements for the preceding

year and a statement in such detail as the Board of Trustees may require of the financial ocndition of the University at the end of such year.

4. He and the personnel under him shall be bonded to the extent determined by the Executive Committee.

Article XIV

VICE PRESIDENT FOR INSTITUTIONAL ADVANCEMENT

The Vice President for Institutional Advancement shall be an executive officer, under the President, responsible for all public and alumni relations, fund raising, and long range planning and development. He shall have the powers and duties assigned to him by the President and shall report to the President.

Article XV

TREASURER

1. The Treasurer shall report to the President or such officer of the University as the President may direct and shall have the powers and duties assigned to him by the President or such other officer.

2. He may receive and disburse investment funds and purchase, sell, or otherwise dispose of investment securities pursuant to the directions of the Executive Committee or Investment Committee, as the case may be.

3. He and the personnel under him shall be bonded to the extent determined by the Executive Committee.

Article XVI

SECRETARY

1. The Secretary, under the President, shall have all of the powers and duties set forth in these Bylaws and the powers and duties commonly incident to his office. He also shall have the powers and duties assigned to him by the President and shall report to the President.

2. He shall be the custodian of the seal of the corporation and shall affix and attest to same on all duly authorized contracts, deeds, and other documents.

3. He shall maintain an official roster setting forth the status of all persons employed by the University.

Article XVII

UNIVERSITY COUNSEL

The University Counsel shall be the legal advisor to the University and shall be responsible for all matters of a legal nature concerning the University, including litigation, preparation or approval of all contracts, deeds, conveyances, or other documents.

Article XVIII

FACULTY

1. The University Faculty shall be composed of the President, the Provost, the Vice Presidents, the Secretary (who shall also be the Secretary of the Faculty), all deans, professors, associate professors, and assistant professors, Registrar, and the University Librarian, and such other persons as may be designated by the President and approval by the Executive Committee or the Board of Trustees.

2. The University Faculty shall be responsible for the conduct of instruction and research in the various colleges and schools in the University. It may also consider and make recommendations to the President regarding any and all phases of education at the University.

3. The University Faculty shall approve and recommend to the Board of Trustees the persons it deems fit to receive degrees or other marks of distinction, and the establishment of any new degree or diploma.

4. The University Faculty may organize and exercise its functions through appropriate councils, committees, or other bodies.

5. Each college and school in the University may have a faculty of its own,

which shall be composed of the President, the Provost, the Secretary, and all members of the University Faculty in the particular college or school. Each such faculty shall function under the President and other officers of educational administration and subject to the regulations of the University Faculty.

ARTICLE XIX

APPOINTMENTS, PROMOTIONS AND TENURE

1. Members of the University Faculty shall be elected, appointed, or promoted by the Board of Trustees or the Executive Committee upon the recommendation of the Provost, with the approval of the President.

2. Members of the University Faculty, above the rank of instructors, shall have tenure after seven years of continuous service at the University, or such shorter period as may be determined for individual cases, by the Board of Trustees or the Executive Committee; provided that any such person shall be subject to dismissal by the Board of Trustees or the Executive Committee for misconduct or neglect of duty.

ARTICLE XX

SABBATICAL LEAVES

1. Each member of the University Faculty of the rank of professor, associate professor, or assistant professor shall be eligible for sabbatical leave after each six years service to the University. Such leave may be taken for a full year at half salary or a half year at full salary.

2. Sabbatical leave may be granted by the Executive Committee upon the written recommendation of the dean of the appropriate college or school, approved by the Provost and the President.

ARTICLE XXI

RETIREMENT

1. All members of the faculty of the University who are eligible for or participate in the TIAA Plan and who would attain the age of seventy years prior to March 1 of a given academic year shall retire at the end of the preceding academic year and all such members of the faculty who attain the age of seventy years on or after March 1 in a given academic year shall retire at the end of such academic year.

2. The retirement and annuity plan adopted by the University on October 1, 1925, is hereby amended in those respects required to conform with the provisions of the Bylaws.

ARTICLE XXII

FISCAL YEAR, ACADEMIC YEAR, AND ACADEMIC CALENDAR

1. The fiscal year of the University shall commence on July 1 and end on the following June 30.

2. The academic year of the University shall commence on September 1 and end on the following August 31.

3. The President shall establish the academic calendar for each academic year, except that graduation exercises shall take place on the first Monday in June of each year.

ARTICLE XXIII

AMENDMENT OF BYLAWS

These Bylaws may be amended at any regular meeting of the Board of Trustees by the affirmative vote of two-thirds of the then membership of the Board, provided that the proposed amendment is mailed by the Secretary of the Board to each member at least twenty days before the meeting.

Officers of the University for the Year 1964-65

The Corporation

THE UNIVERSITY TRUSTEES

(The date in parentheses indicates the year of election.)

Trustees whose term expires December 31, 1965

George Venable Allen (1961)	Washington, D. C.
A. Merrimon Cuninggim (1963)	St. Louis, Mo.
Benjamin Everett Jordan (1943)	Saxapahaw, N. C.
George Crews McGhee (1962)	Bonn, Germany
Marshall I. Pickens (1963)	Charlotte, N. C.
Henry Gibbons Ruark (1962)	Rocky Mount, N. C.
Walter McGowan Upchurch, Jr. (1964)	New York, N. Y.
Charles Byrd Wade, Jr. (1964)	Winston-Salem, N. C.

From the Alumni

Thomas A. Aldridge (1959)	Naples, Fla.
Kenneth Millikan Brim (1952), *Vice Chairman*	Greensboro, N. C.
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UNDERGRADUATE INSTRUCTION

TRINITY COLLEGE

THE WOMAN'S COLLEGE

THE COLLEGE OF ENGINEERING

Admission

NEW STUDENTS are admitted for the academic year at the opening of school in the fall.

The size of the entering classes is approximately as follows: Trinity College, 600; Woman's College, 350; College of Engineering, 175; the School of Nursing, 95. Since five thousand candidates normally apply and enrollment is limited, the Committee on Admissions selects those students who in its judgment are best qualified to benefit from the opportunities which the colleges offer. Selection is based not only upon academic grades and test scores but also upon recommendations of school officials and other personal criteria.

Although there are no inflexible subject matter requirements, at least fifteen acceptable units of secondary school credit must be presented. Of these at least twelve must be in college preparatory subjects: English, foreign language, history and social studies, mathematics, and physical or biological sciences. Applicants for the College of Engineering are advised to present four units of mathematics and at least one unit in physics or chemistry.

Students applying for admission are required to take the Scholastic Aptitude Test, the English Composition test, and two other achievement tests of their own choosing given by the College Entrance Examination Board. Candidates applying to the College of Engineering must include the appropriate mathematics test.

Prospective students are urged to broaden their reading outside of class during their senior year and to make the acquaintance of books and magazines that do not form part of the subject matter of their courses. At the same time, they should take every opportunity to increase their competence in writing. Those who cannot write simple, clear, grammatical English prose will be progressively at a serious disadvantage in the competition for admission and also in the general work of the Freshman year. Careful attention to correctness in English in correspondence and on application blanks cannot be too seriously stressed for candidates for admission.

Early Decision Plan

For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on December 1 of the student's senior year in secondary school. The deadline date for completing applications for Early

Decision is November 1. Interested students should write to the Office of Admissions for detailed information.

Regular Admission

Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group, decisions are mailed by April 15.

Application forms and instructions regarding procedure and necessary documents to be included will be sent upon request to the Office of Admissions, Duke University, Durham, North Carolina, 27706. A non-refundable processing fee of $10.00 must accompany the submission of the full application form.

Candidates for admission to the School of Nursing should address their inquiries to the Dean of the School of Nursing, Hanes House, Duke University, Durham, N. C., 27706.

A candidate for admission who wishes to arrange an interview should do so through the Director of Undergraduate Admissions.

Admission to Advanced Standing

Admission by transfer from other institutions may be arranged for a limited number of students, under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal, and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students may not apply for transfer beyond admission to the junior class. Further detailed regulations for admission by transfer may be obtained from the Office of Admissions.

A small number of special students of mature age may be admitted for such courses of instruction as their earlier training and experience may qualify them to take. They may not be accepted, however, as candidates for a degree in a regular course unless they are able to meet all normal requirements for admission which apply to all beginning students.

Former students who have for various reasons withdrawn from college and who wish to continue their collegiate careers should apply to the Office of Admissions, with a detailed account of their activities since withdrawal from college.

Student Life and Services

The Libraries

TO SUPPORT a rich educational experience in a world of rapid and far-reaching change, great library collections are essential. Undergraduate students at Duke are fortunate to have available exceptional resources. The University library, among the first nineteen university libraries in the country, contains 1,650,000 volumes and 4,000,000 manuscripts. About 60,000 volumes are added annually. Separate departmental and professional school libraries provide notable collections in the several disciplines.

The Woman's College library, with its own attractive Georgian building contains 145,000 volumes in an open stack collection, chiefly those books most frequently used in the undergraduate curricula. The larger collections of the main and specialized libraries are at hand when needed.

More detailed information may be obtained in a "Student's Guide to the General Library," available on request to the Librarian of the University.

Medical Care

The Student Health Program is closely related to the Teaching Hospital of the Duke University Medical Center. This arrangement provides an unusually comprehensive service, available at all times. The cost, for regularly enrolled students, is included in the general fee paid each semester, and in the fees charged each student in the summer quarter.

The Service is under the direction of the University Physician with the cooperation of the Staff. It includes hospitalization in Duke Hospital, as deemed necessary by the Hospital Staff, but limited to thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Special nursing is not covered. Students pay for board while in the hospital. Refraction of eyes, treatment of teeth and of all chronic and pre-existing conditions, such as diseased tonsils, hernias, pilonidal cysts and other elective surgery, chronic skin conditions, endocrine disturbances, etc., are not included. The cost of any necessary braces and orthopedic appliances, and special nursing, must be borne by the students. Blood used for transfusions must be paid for or replaced.

If students have insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of their medical care. Accidents or illnesses occurring during vacations or while off the campus are not included in this service. A special commercial policy available only to regularly enrolled Duke students furnishes complementary protection, if desired.

Advisory consultation with a psychiatrist at no expense is available to students through referral either by the Student Health Physicians or by the Deans, but office visits for psychotherapeutic interviews are not included in this service.

A woman physician is in charge and a nurse in constant attendance at the Woman's College Infirmary. Women students receive ambulant care at regular office hours, and patients in this Infirmary can be transferred to the Duke Hospital at any hour of the day or night.

Male students receive ambulant care at the Student Health Office in the hospital during regular office hours. The emergency service and the specialist consulting services of the Hospital and Medical School are always available.

Students are given careful physical examinations upon arrival at the University. Every applicant should be re-vaccinated against smallpox within three years before admission to the University. It is urgently advised that an oral vaccine routine for poliomyelitis be completed by all students and that all be actively immunized to tetanus by injections of toxoid.

Simple directions for procedure in reporting the students' needs for medical care are contained in the Student Handbook supplied to each student upon entering.

Special Services

Other services of many kinds are available to all undergraduate students. Among these may be cited the educational, personal, and vocational counseling provided through the University Counseling Service. Through the Appointments Office, undergraduates are assisted in their search both for summer employment and post-graduation positions.

Physical Education

Students of Trinity College and the College of Engineering who have no restrictive physical handicap must enroll in a physical education class each of four semesters. The first two of these four involves Foundations of Physical Education. This course gives emphasis to the how and why of Physical Activity. Following an extensive test battery designed to assess basic body potential, students are presented with

information and techniques necessary for making desirable physical changes and maintaining health and fitness while in college and throughout life. They are given an opportunity to become acquainted with a variety of skills in team, individual, and dual sports, and are guided into future activities which will most adequately meet their needs. Students who cannot swim are required to learn how during the Freshman year. The last two semesters may be devoted to activity of the individual's choice from a number of sports of a recreational nature, such as badminton, basketball, golf, handball, swimming, tennis, and volleyball. A total of four semester hours credit toward graduation and quality points according to the marks assigned are awarded for these activities. In instances where the University Health Service examination indicates that specific types of activity may be beneficial, a modified program is available as medically prescribed. Normal credit is awarded for participation in the modified program.

In addition to the four semesters of required physical education, each student may voluntarily participate in the intramural program, which includes a dozen sports and attracts a large percentage of the student body. In a typical year more than 3,000 students forming fraternity, dormitory, and organizational teams, participate in seventeen tournaments and compete for more than fifty trophies.

For each semester of undergraduate enrollment, the student is issued a uniform appropriate for the season and the activity in which he is engaging. The uniform is issued, exchanged, laundered, and maintained at no additional expense to the student. Students may check out various sports equipment and may use all facilities when not otherwise scheduled. This includes the following:

Golf Course	Swimming Pool	Gym Floor	Gymnastics Area
Tennis Courts	Handball Courts	Weight Room	Archery Range

Numerous clubs dealing with Fencing, Gymnastics, Scuba Diving, Sailing, Cycling, etc. are also available to interested students.

The physical education program in the Woman's College is designed to give the students an appreciation of the value of activity for general physical well-being, skill in one or more activities which can be enjoyed as recreation during and after college, a well-developed and well-coordinated body, and a knowledge of good posture. To this end, students are allowed to choose from a large number of activities, including individual, dual and team sports, swimming, and several types of dancing. Each student during her two years of required physical education must elect one course in dance. Students who are unable to pass the swimming test must elect one course in swimming. Students whose test scores indicate special needs must elect a course in fundamentals of movement, rhythm, sports, or posture during the first half-semester.

Within the Woman's Recreation Association various clubs including Terpsichorean (modern dance), Nereidian (water ballet), and other sports groups offer opportunities for each student to take part in the various extra-curricular activities most interesting to her. The swimming pool, tennis courts, bowling alleys, and other athletic facilities are available to all students for use at specified times.

In order to maintain certain hygienic standards of physical education and intramural athletics, the University has made available for all students, in addition to facilities for physical activity and recreation, the following equipment and services:

1. Gym suit, dance leotard, bathing suit, warm-up suit.
2. Provision for locker and handling of uniform.
3. The laundering of uniforms and towel as needed.

THE INTERCOLLEGIATE ATHLETIC PROGRAM FOR MEN

The program, controlled entirely by the University, consists of the organization and training of representative freshman and varsity teams in football, baseball, basketball, track, cross country, golf, lacrosse, soccer, swimming, tennis, and wrestling. In addition to these intercollegiate sports an informal fencing program is sponsored by the University.

The program is under the supervision of the Athletic Council, composed of seven members. Three of the seven are appointed by the President of the University from the faculty as follows: one member from the Officers of General Administration, one from the Officers of Educational Administration, division of the Colleges, and one from the Officers of Instruction of the undergraduate colleges. From this group the President of the University appoints the faculty chairman, who serves as chairman of the Athletic Council and of its executive committee.

Four of the seven members are selected from the alumni. One of the four, a University Trustee, an alumnus, and a member of the Board's standing Committee on Physical Education and Athletics, is appointed not less frequently than every three years by the chairman of the Board of Trustees. The remaining three, who may not succeed themselves, are elected annually by the general Alumni Association for terms of three years. The Director of Alumni Affairs serves *ex officio* as secretary of the Council and of the executive committee.

The three faculty members of the Athletic Council constitute a committee which has the responsibility of enforcing the scholarship and athletic requirements of the University for participation in intercollegiate sports. The athletic eligibility rules are those of the Atlantic Coast Conference.

The executive committee of the Athletic Council is composed of the faculty chairman of the Council, one other faculty member of the Council and one alumni member of the Council. The executive committee of the Council recommends to the President of the University persons to serve as Director of Athletics and as coaches in the various sports. The election of such persons, however, rests solely with the Board of Trustees of the University or with its Executive Committee on recommendation of the President of the University. The Director of Athletics recommends to the Athletic Council athletic schedules and the award of insignia of merit earned by members of the athletic teams. These decisions are the responsibility of the Athletic Council subject to approval of the President.

Each of the four undergraduate classes selects annually, for a term of one year, a member of each respective class to serve in an advisory capacity to the Athletic Council on the matter of awarding insignia of merit.

All funds from athletic events are handled entirely by the Treasurer of the University. An audit of the receipts and disbursements of these funds is made annually by the official auditors of the University and a report thereof made annually to the Executive Committee of the Board of Trustees.

Social and Cultural Organizations

Although the campuses for men and women are geographically separated, extra-curricular life is in many respects coeducational. Each campus has its own Student Government Association, its own inter-social councils, and its own local and individual groups. In many areas all of these meet for inter-college life. The scope of these more than one hundred separate student organizations fall into many broad interest areas, such as student government, service, professional and honorary, publications and radio, music, drama, and social.

In the area of government, in addition to the Student Government Associations, are the Pan-Hellenic and Interfraternity Councils, the Independent House Association, and the Social Standards Committee. The Student Union, Symposium Committee, and the YMCA and YWCA groups are primarily service organizations. The Professional and Honorary organizations are numerous and include traditional Greek letter societies, such as Phi Beta Kappa, as well as national and local academic and leadership groups.

The Duke Chronicle, the campus newspaper, is published twice a week, and the student radio station, WDBS, operates daily. Three magazines and a comprehensive yearbook are published by students. Student publications are under the control of the Publications Board, composed of six members from the University staff appointed by

the President; six men from the Junior and Senior classes, elected by the students in Trinity College and the College of Engineering; four women from the Junior and Senior classes, elected by the students in the Woman's College; and one from the Junior and Senior classes, elected by the students in the School of Nursing; and four editors and four managers of student publications, *ex officio* members without voting power. No student publication can be established at the University without the approval of the Board.

The musical groups include the Chapel Choir, Symphony Orchestra, Concert Band, Glee Clubs, and several smaller groups. The Duke Players present a number of plays and readings each season. The Hoof 'n' Horn Club annually produces a musical comedy which is written, cast, directed, and acted by students from the three colleges.

Other campus groups, social in nature, sponsor dances, chaperoned cabin parties, concerts, and informal discussion groups. Social functions are frequent enough to afford the relaxation needed from work required in class room and laboratory.

Approximately half of the undergraduate students belong to fraternities and sororities. Although there are no chapter houses, the program of fraternity and sorority activity is carried on within the sections of the regular dormitories or buildings set aside for this purpose. Eighteen national social fraternities and thirteen national sororities have chapters on campus.

The Union Building, located on the West Campus, is the student center for coeducational activities. It houses, among other groups, the Student Union organization. This body is unique in its coeducational aspects, bringing the men and women together in the carrying out of its stated purpose, "to stimulate, promote, and develop the social, recreational, cultural, educational, and spiritual activities of the students of Duke University." This purpose is carried out through a broad program including lectures, concerts, recreational activities, dances, exhibits, etc., adapted to the leisure time interests and needs of all students, who as undergraduate students are members of the Union.

In one section of the West Campus Union are housed the Alumni offices, dining facilities, University store, grill, soda fountain, post office, barber shop, bank, and ball room. Elsewhere in the building are student organization offices, meeting rooms, an information center, and music, reading, lounge and recreational areas. Many similar service and activity areas for the Woman's College are provided on that campus.

Religious Life

"Eruditio et Religio," the motto emblazoned on the seal of the University, proclaims belief in the essential union of knowledge and

religion in the educational process. The Gothic Chapel stands at the center of the campus, an inspiring symbol of the place of religion in the well-balanced life. The Chapel program encourages the cultivation of the moral and spiritual life of students.

In the University Service of Worship on Sunday morning two hundred students participate by singing in the choir; at least one hundred other students aid in special ways, as ushers, collectors, and assistants in the communion services.

Opportunities are provided through the Chapel and its related activities to translate worship into effective Christian living. Denominational, interdenominational, and interfaith loyalties are emphasized. Protestant, Roman Catholic, and Jewish students are organized in their respective groups, each having a denominational chaplain or adviser.

The University Religious Council, composed of students and faculty, promotes the interdenominational religious life in its many facets. The work of the Council and of the denominational program is under the supervision of the Chaplain to the University, who is also Director of Religious Life. He, with two Associate Directors of Religious Life and six denominational chaplains, coordinates the religious program of the campus. They also offer personal guidance and spiritual counsel to all students in matters related to their faith.

The Dean of the Chapel is a key figure in student religious life. A regular preacher to the University, he preaches in the Chapel each month. He serves as an officiating minister and participates in the planning of the University's religious program.

Additional opportunities for the enrichment of the student's religious life are offered in organ and carillon recitals, choral concerts, other special services held from time to time, and in the sermons of distinguished guest preachers from many lands who are heard in the Duke Chapel. Some students, at their own discretion, participate actively in the programs of the downtown churches of their choice.

Reserve Officers Training Corps

Through the Naval and Air Force Reserve Officers Training programs the University is cooperating with the Department of Defense in providing well-educated officers for the regular and reserve forces of the Nation.

THE NAVAL RESERVE OFFICERS TRAINING CORPS: There are two basic programs through which students can qualify for Naval commissions upon graduation; one, the Regular Naval Reserve Officers Training Corps program, which provides a maximum of four years in the University largely at government expense, followed by a commission in the regular Navy or Marine Corps; the other, the

Contract program, which leads to a commission in the Naval Reserve or the U. S. Marine Corps Reserve.

The Regular Student—Quotas are awarded on the basis of an annual nation-wide test and selection procedure. Students selected are appointed Midshipmen, USNR, and receive four years tuition, fees, and textbooks at government expense plus retainer pay at the rate of $600 per year. The regular midshipman may take any course leading to a baccalaureate or higher degree with certain exceptions, e.g., pre-medicine and medicine, pre-theological and theological, music and art. His academic program must include 21 semester hours of Naval Science, 3 semester hours of General Psychology, one year of college physics and one year of college mathematics. The Naval Science requirement is reduced to 15 semester hours for students who are awarded Engineering Degrees upon graduation; Naval Engineering is waived and, in lieu of Naval History (NS 102, 3 s.h.), the Engineering student is required to take Naval History and Elementary Strategy (History 99, 3 s.h.). The Regular midshipman participates in two summer training cruises aboard ship and receives aviation and amphibious indoctrination at naval shore stations for one summer. Upon graduation he receives a commission as Ensign in the Regular Navy, or Second Lieutenant in the Regular Marine Corps, after which he serves with the Navy or Marine Corps, as required by the Secretary of the Navy in the same manner as his officer contemporaries who are graduates of the U. S. Naval Academy. The minimum period of commissioned service is four years for regular officers.

The Contract Student—The contract student is selected from those regularly enrolled in Duke University who desire to qualify for a commission in the Naval or Marine Corps Reserve while pursuing normal courses of study. Since he will be ordered to three years active duty immediately on graduation and commissioning, the Navy does not recommend that a medical, dental or theological student apply for this program. He must include in his academic program mathematics through trigonometry (if not successfully completed in secondary school), or one semester of college mathematics, 3 semester hours of General Psychology, and 21 semester hours of Naval Science. The Naval Science requirement is reduced to 15 semester hours for students who are awarded Engineering degrees upon graduation; Naval Engineering is waived and, in lieu of Naval History (NS 102, 3 s.h.) the Engineering student is required to take Naval History and Elementary Strategy (History 99, 3 s.h.). He has the status of a civilian who has entered into a mutual contract with the Navy and is not eligible for the benefits and pay received by regular midshipmen. He receives retainer pay of $40 a month during his last two years in the NROTC. He goes aboard ship for one summer training cruise, normally between his junior and senior years. Upon graduation, he is commissioned

in the Naval or Marine Corps Reserve and reports for a minimum of three years active duty. Upon completion of the minimum active service requirements he may request transfer to the regular component of the Navy or Marine Corps, retention on active duty as a reservist, or transfer to the inactive reserve.

Both Regular and Contract midshipmen are deferred from Selective Service by virtue of their commitment to serve on active duty after graduation. The Navy furnishes necessary uniforms and equipment. Uniforms are worn only on drill days or other special occasions when prescribed by the Professor of Naval Science. Regular and Contract students receive the same instruction and wear the same uniforms. No distinction is made between the two in the NROTC Unit. Contract students may compete each year for the Regular Program, and if selected, they will be appointed to Regular status with the subsequent benefits.

THE AIR FORCE RESERVE OFFICERS TRAINING CORPS:

This unit functions as a regular department of instruction known as the Department of Aerospace Studies. It selects, trains, and commissions college men who desire to serve in the United States Air Force.

For enrollment in the Basic Course (freshman and sophomore years) the student must be accepted by the institution as a regularly enrolled student; must successfully complete such general survey and screening tests as may be prescribed; and must sign a loyalty certificate with the U.S. Government. Students initially entering the University who have had previous preparatory or high school military training are normally accepted in the Basic Aerospace Studies at the same academic level as that in which they are accepted by the University. The student may elect to attend a six weeks Field Training Course conducted at selected Air Force Bases instead of enrolling in the Basic Course. If he chooses this option he will report to the Field Training Unit during the summer between his sophomore and junior years. To be eligible for continuation, or initial enrollment, in the Advanced Course (junior and senior years), a person must:

(1) be a citizen of the United States;

(2) be selected for advanced training under Air Force procedures;

(3) enlist in the United States Air Force Reserve;

(4) contract, with the consent of his parent or guardian if he is a minor, to complete the program of advanced training;

(5) agree in writing that he will accept a commission in the United States Air Force, and that he will serve in the Air Force for the period prescribed by the Secretary of the Air Force;

(6) complete successfully:

(a) the Basic Course; or

(b) six weeks of summer Field Training; or

(c) have had at least one year of honorable service in the Armed Forces of the United States. Students who qualify for the Advanced Course by successfully completing the Basic Course must attend four weeks of Field Training between their junior and senior years. Students must also agree to take orientation flights when offered; must be less than 28 years of age at the time of graduation; must successfully complete such general survey and screening tests as may be prescribed and must be selected by the Professor of Aerospace Studies and the appropriate authority of the University.

Students in the Basic Course may be deferred from Selective Service upon satisfactory completion of one semester of Basic Aerospace Studies. Advanced students are deferred as soon as they are formally enrolled in the Advanced Course.

All uniforms, texts, and training equipment required for the Aerospace Studies Course are furnished at government expense, and students are paid a total of approximately $900.00 for the two years of the Advanced Course.

A thirty-five hour Flight Instruction Program using light aircraft is restricted to seniors who may, upon completion of the course, qualify for a Civilian Private Pilot's License. To participate in this program, Fourth Year Cadets must be physically and aptitudinally qualified for the Air Force Flight Instruction Program.

Upon graduation and completion of the Advanced Course, selected students for flying or line assignments will be offered commissions as Second Lieutenants in the Air Force Reserve. Reserve Officers who desire lifetime careers in the Regular Air Force may apply for regular appointments after serving on active duty for one year. Cadets who maintain a high academic and aptitudinal average are eligible for designation as Distinguished AFROTC Cadets and later Distinguished AFROTC Graduates. A designee, if fully qualified, may apply for a regular commission upon graduation.

The Summer Session

THE SUMMER SESSION at Duke University makes available to Duke undergraduate students and to undergraduates from other universities and colleges a notable program of instruction in many fields of knowledge both academic and professional.

Undergraduates in Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending two or more summer sessions.

Undergraduates from other colleges and universities may enjoy the special advantages of summer instruction at Duke and transfer their earned credits to their own institutions.

The Summer Session of 1965 will include two terms: Term I, June 12 to July 17; Term II, July 19 to August 24. By attending both terms it is possible for a student to earn as many as twelve semester hours of credit.

Instruction of interest to undergraduates will be offered in the summer of 1965 in the following departments and colleges: Botany; Chemistry; Economics and Business Administration; Education; Nursing; Engineering; English; Forestry; French; Geology; German; Greek; Health and Physical Education; History; Latin and Roman Studies; Mathematics; Philosophy; Physics; Political Science; Psychology; Religion; Sociology; Spanish; and Zoology.

Distinctive features of Summer Session instruction are provided by the program in marine biology offered at the Duke Marine Laboratory, Beaufort, North Carolina, and by various conferences in several of the Departments.

While the basic purpose of the Summer Session is to serve the academic and the professional requirements of those who are interested in their own educational advancement, the University recognizes the need of, and provides for, a varied recreation program both athletic and social.

Undergraduates of Duke University, both men and women, who plan to attend the Summer Session should enroll with the Dean of their own college in Duke University. Undergraduates in other universities or colleges who seek transfer credits should apply directly to the Director of the Summer Session, Duke University, Durham, North Carolina.

Financial Information

THE prospective student who seeks the optimum opportunity in higher education will not be a bargain hunter. Certainly, some sound plan for paying the cost of college must be devised, but this plan should be formulated after the thoughtful selection of an institution has been made. No college or university can honestly say that an education at the college level is inexpensive. Most university people and the ever growing college alumni families across our nation, however, will reflect the feeling that the benefits derived from a college education constitute a handsome return on the dollars invested.

Each student going to college should analyze carefully his financial situation. In making such analysis it should be recognized that the primary responsibility for defraying the cost of an education lies with the student and his family. The typical college student can depend upon some contribution from his family's current income, a proportionate share of family savings, and anticipated income from summer employment. The number of years of study contemplated and the number of dependent children in the family should be considered in computing the funds which will be available in a particular year.

Fees paid by the students cover only a part of the cost of their instruction and of the operations of the University. Income from endowment and contributions from the alumni, alumnae, and other public-spirited men and women meet the balance, which constitutes more than half the total cost.

ESTIMATED EXPENSES FOR AN ACADEMIC YEAR

Certain basic expenditures are to be considered in preparing a student's budget, such as tuition, the general fee, room and board. The necessary expenditures together with a reasonable amount allotted for miscellaneous items such as laundry, organizational dues, and sundry purchases are shown as follows:

Undergraduate Men		*Undergraduate Women*	
Tuition	$1,250.00	$1,250.00	
General Fee	187.00	187.00	
Room Rent	250.00	275.00	
Board	500.00 (Cafeteria estimate)	450.00	(Board Rate)
Books and Supplies	70.00	70.00	
Miscellaneous Expenses	443.00 (Moderate estimate)	443.00	(Moderate estimate)
Totals	$2,700.00	$2,675.00	

Miscellaneous expenses beyond the moderate estimate given above depend to a large extent upon the tastes and habits of the individual. It is realistic to suggest that the average Duke student, however, can plan on a budget of $2,700.00 for the academic year. Travel costs, clothing purchases, and other major expenditures would have to be added to this estimate.

Tuition and Fees

The tuition of $625.00 and the general fee of $93.50 are due and payable not later than the day of registration for a particular semester. After the day of registration no refund of the tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

New students, on notification of acceptance, are required to pay a non-refundable first registration fee of $20.00 and to make a deposit of $50.00. The $50.00 deposit will not be refunded to accepted applicants who fail to matriculate. For those who do matriculate, $25.00 of the deposit serves as a continuing room deposit for successive semesters, and the remaining $25.00 as a continuing registration deposit. Arrangements for refund of the $25.00 room deposit are described in information furnished each resident student by the Housing Bureau. The $25.00 pre-registration deposit will be refunded to students (1) whom the University does not permit to return, (2) who graduate, or (3) who request the refund at the time of pre-registration, thus indicating their intention not to return for the following semester. The pre-registration deposit will not be refunded to students who pre-register and fail to enter the following semester on schedule.

Students who have been readmitted to the University after an absence of one or more semesters, on notification of readmission, are required to make the $50.00 room and registration deposits.

An Air Force ROTC deposit of $20.00 is required of students enrolling in Air Science to cover possible loss of military equipment issued to them. This deposit is refunded to the student upon return of issued equipment.

Living Accommodations

As the undergraduate colleges of the University are resident institutions, all students are required to live in the residence halls. Any exceptions must be approved by the Dean of Men or the Dean of Women. Rooms are not rented for a shorter period than one semester. No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds are made in accordance with the University's established schedule.

Accommodations on the West Campus for Students of Trinity College and the College of Engineering

Upon their admission to Trinity College or the College of Engineering men students are sent detailed information by the University Housing Bureau concerning their obligations under the housing contract. Undergraduates occupy Wannamaker Hall and Craven, Crowell, Few, and Kilgo Quadrangles. The houses in Kilgo and part of Crowell are reserved for members of the freshman classes. Each of these units has a resident Head Housemaster and one or more Housemasters. A limited number of Freshmen reside in other houses where they live in community with upperclass students and a Fellow, a Faculty member or an advanced graduate student who serves as their adviser.

In the residence houses for undergraduate men the rental charge for a single room is $300.00 for the academic year or $150.00 for each semester; for a double room the charge is $500.00 for the academic year or $250.00 for each occupant, or $125.00 per semester for each occupant.

The dining facilities on the West Campus include three cafeterias, with multiple-choice menus, and the Oak Room where full meals and *a la carte* items are served. The cost for the academic year ranges from $500.00 upward depending upon the taste of the individual.

Accommodations on the East Campus for Students of The Woman's College

All residence houses of The Woman's College—Addoms, Alspaugh, Aycock, Bassett, Brown, Gilbert, Giles, Jarvis, Pegram, and Southgate—have both single and double rooms. These houses are alike in their organization. In each of them there is a resident House Counselor, who is a member of the Dean's staff, and full representation from all four classes, the appropriate number of places being reserved each year for freshmen.

The two additional, smaller housing units are located in the Faculty Apartments. One of them is assigned to the French Corridor where qualified upperclassmen can gain experience in speaking the language and can share their interests in French literature, culture, and customs. A native French woman serves this group as resident Faculty Associate. French is spoken exclusively in this area and at the French Table in the dining halls where residents of the Corridor have their evening meals.

The other smaller housing unit in the Faculty Apartments is assigned to the Experimental Dormitory group. This group has a flexible house structure designed to permit the fullest development of the diverse interests and intellectual concerns of its members. It is advised by a resident Faculty Associate.

In the residential units of The Woman's College the rental charge for a single room is $325.00 for the academic year or $162.50 for each semester. The rental charge for a double room is $550.00 for the academic year or $275.00 for each occupant, or $137.50 per semester for each occupant. Detailed information concerning the student's obligations under the housing contract is published in the Woman's College Handbook.

The dining halls in which all resident students have their meals are located in the Woman's College Union and in Gilbert-Addoms residence hall. The charge for board is $225.00 per semester, payable at the time of registration. If a student withdraws during the first six weeks of the semester, a board refund is made on a *pro rata* basis; if withdrawal occurs after that time, no refund is allowed.

Because of the large number served in the dining halls, it is not possible to arrange special diets for individual students.

Other Information

In the regular academic year students who register for no more than two courses with a maximum credit of 8 semester hours are classified as special students. They are charged a registration fee of $5.00 for each course and $12.00 for each semester hour of course credit. Registration for 9 or more semester hours, or 3 or more courses, requires payment of full fees.

Auditing of one or more courses without charge is allowed students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for not less than 3 nor more than 8 semester hours may audit other courses by payment of $21.00 for each course audited.

In order to encourage its employees in their professional and personal advancement, Duke University will permit full-time employees who are paid on a monthly basis to take one or two courses, but not more than seven semester hours and will charge $5.00 per course plus $21.00 per semester hour.

One transcript is issued free of charge. Additional copies are supplied at $1.00 each.

No records are released and no student is considered by the faculty as a candidate for graduation until he has settled with the Bursar for all indebtedness.

Bills may be sent to parents or guardians provided the Bursar has been requested in writing to do so. Failure to pay bills on or before the due dates will debar the student from class attendance until the account is settled in full.

Financial Aid

Duke University is interested in students with ability and ambition. It is the aim of the University Financial Aid Committee and others affiliated with the Financial Aid Program to provide, insofar as possible, the financial assistance required by students accepted for entrance who are unable to defray the cost of college from their own resources. The assistance is made available in the form of scholarships, grants-in-aid, loans and part-time employment.

In 1964-65 financial aid totaled $1,558,000. Of this amount $926,324 was allotted to 1,116 undergraduate students in the form of scholarships, grants-in-aid, and remissions of tuition; $231,700 in student loans, and approximately $400,000 through part-time employment on the campus and in the city of Durham and the surrounding area.

Freshmen students shared proportionately in this aid: 338 received awards totaling $301,062 in direct assistance not including loans or part-time employment.

SCHOLARSHIPS: All requests for applications for scholarships, grants-in-aid, industry scholarships or remissions of tuition should be addressed to the Office of Admissions, Duke University, Durham, North Carolina.

All candidates for scholarships and grants-in-aid must submit an official Application for Admission to the University and the Application for Scholarship to the office of Admissions. Scholarship candidates who desire to be considered for the maximum value of scholarships on the basis of financial circumstances are required to submit the "Parents' Confidential Statement" of the College Scholarship Service. The "Parents' Confidential Statement" may be obtained from high school principals or upon request from the Admissions Office.

Scholarship candidates should initiate their applications during the fall semester of their senior year of study in secondary schools. Instructions concerning the specific requirements and deadline dates will accompany the application materials sent to applicants for scholarships and grants-in-aid.

Awards annually available to undergraduate students at Duke University fall into eight major categories. These are:

(1) *Angier B. Duke Memorial Scholarships:* Recipients of these awards are students whose superior records mark them as young men and young women who give outstanding promise of becoming leaders in their chosen fields of endeavor.

Number available: 31 for each Freshman class.

Value: To $2,600.00 annually.

(2) *W. N. Reynolds Memorial Scholarships:* Recipients of these awards are students of outstanding ability, superior records and the promise of constructive leadership. In considering candidates for the awards, first consideration will be given to:

1. Children of employees of R. J. Reynolds Tobacco Company or any of its affiliates or subsidiaries.
2. Children of families residing in Forsyth County, North Carolina.
3. Other candidates who are residents or natives of North Carolina.

(3) *Duke University School of Nursing Scholarships:* Recipients of these awards are young women whose superior records indicate outstanding promise of becoming leaders in the profession of Nursing.

Number available: 11 for each Freshman class.
Value: $200 to $1,400.00 annually.

(4) *Huguenot Scholarship:* A scholarship of $1,000.00 per year is available from the Huguenot Society of America to a decendant of a Huguenot ancestor.

(5) *Grants-in-Aid:* Recipients of these awards are able students who need financial assistance in order to meet the cost of attending college.

Number available: Approximately 400 annually.
Value: From $100.00 to $1,500.00 annually.

(6) *Remissions of Tuition:* Children of ministers in the North Carolina and Western North Carolina Conferences of the Methodist Church who are resident in the conference and children of ministers of all faiths residing in Durham County are eligible to receive a remission of the tuition charge for a maximum of eight semesters of undergraduate study at Duke University.

(7) *Tuition Grant:* Tuition grants are available to children of certain qualified staff members of Duke University for a maximum of eight semesters of undergraduate study at Duke University.

(8) *Corporate Scholarships:* Certain scholarships financed by private corporations are available annually to undergraduate students at Duke University. The selection of the recipients of these awards is made by the University Scholarship Committee. These scholarships are assigned to students whose records of scholarship and leadership are outstanding and whose financial need can be demonstrated.

Number available: 18.
Value: $500.00 to $2,000.00 annually.

CHRISTIAN VOCATIONS SCHOLARSHIPS: Students preparing to enter full-time religious work are eligible to apply for special consideration on the basis of need. These students will be required to submit the "Parents' Confidential Statement." Students with need will be recommended by the Director of Financial Aid to the Christian Vocations Scholarship Committee which will consider the intention of the applicant. Students approved by the Christian Vocations Scholarship Committee are required to sign a note each semester for the amount of financial assistance granted to them by the University Scholarship Committee. These notes will be cancelled upon evidence that the student has entered full time Christian work after graduation. Pre-ministerial and religious education students ranking in the upper quarter of their graduating classes are encouraged to apply for an Angier B. Duke Memorial Scholarship.

AWARDS FOR FOREIGN STUDENTS: A limited number of awards will be made each year to qualified students from other countries who are accepted by the Office of Admissions as entering freshmen or as students with advanced standings. Candidates for these awards are required to submit the "Application for Scholarship" and the "Parents' Confidential Statement" of the College Scholarship Service provided by Admissions Office of Duke University.

STUDENT LOANS: Students who have completed at least one semester in residence and who have satisfactory academic and citizenship records are eligible to apply for student loans. Loan funds held in trust by the University as well as funds supplied by the federal government through the National Defense Education Act of 1958, are available to qualified students.

Loans generally mature after borrowers have left the University. Loan interest on long term loans from University funds accrues at the rate of 1% from the date of each note. After a student has left the University permanently, the loans begin bearing interest at the rate of 3% per annum. The balance unpaid after five years bears interest at the rate of 6% per annum.

In addition to local loan funds, Duke University participates in the student loan program established under the provisions of the National Defense Education Act of 1958. Repayment of loan funds under the National Defense Education Act of 1958 normally begins one year after the student terminates his education at the University, with complete repayment scheduled within a ten-year period. Interest accrues at the rate of 3% commencing one year after the borrower ceases to be a full-time student at an institution of higher education. Special benefits to those teaching in the public schools permit a portion of the loan to be cancelled depending upon the length of teaching service. Complete details regarding the student loan program may be obtained by writing directly to the Student Loan Office.

The Student Loan Committee in approving loan applications selects those students who, from the standpoint of character, scholastic attainment, personality and degree of financial need, are deserving of this consideration. A student in residence may not, without special permission, own or operate a car during the academic year for which the loan is granted. Loan applications must be submitted not later than July 1, preceding the academic year for which assistance is requested.

STUDENT EMPLOYMENT: The Financial Aid Office maintains an employment office to serve students who need part-time jobs. There are many opportunities both on the campus and in the city of Durham. A considerable number of students each year help defray their college expenses by working.

Those students accepted for admission to Trinity College and the College of Engineering in need of part-time employment should apply to Financial Aid Office, Duke University, Durham, North Carolina. Students in the Woman's College should apply to the Assistant Dean of Undergraduate Women, 108 East Duke Building, Duke University, Durham, North Carolina.

Medals and Prizes

THE achievements of undergraduate students are recognized in various fields of college activity. The following prizes suggest the range of the recognition:

The *Debate Council* authorizes the awarding of medals to members of the graduating class who have represented the University in at least two intercollegiate debates. The medals are given by the local chapter of the Tau Kappa Alpha Fraternity.

The *Robert E. Lee Prize* is the gift of the late Reverend A. W. Plyler, of the class of 1892, and Mrs. Plyler. The sum of $50 is awarded annually at Commencement, preferably to that member of the senior class of Trinity College or the College of Engineering who, in character and conduct, in scholarship and athletic achievement, in manly virtues and capacity for leadership, has most nearly realized the standards of the ideal student. The Vice-President in the Division of Student Life, the Graduate Director of Athletics, and the President of the Student Council constitute a committee to draft and adopt regulations governing the award.

Alpha Kappa Psi Medallion. Beta Eta Chapter of Alpha Kappa Psi, a professional fraternity in commerce, awards annually the Alpha Kappa Psi Scholarship Key to the male senior student pursuing a degree in the Department of Economics and Business Administration who has attained the highest scholastic average for three years of collegiate work in this University.

Medal of the North Carolina Association of Certified Public Accountants. The North Carolina Association of Certified Public Accountants annually awards a medal to the senior who, in the judgment of his instructors, is the most outstanding student in accounting in his graduating class.

Julia Dale Prize in Mathematics is a prize of books given annually to the undergraduate who shows the greatest proficiency in the study of calculus.

The Milmow Prize consists of a certificate of award and a one year's payment of dues in the American Institute of Electrical and Electronic Engineers for the membership year in which the honoree is awarded his baccalaureate degree. It is awarded annually to that student from North or South Carolina graduating in the Department of Electrical Engineering who, in the opinion of the faculty of that department and as shown by his grades, has made the most progress in electrical engineering during his last year in college.

The George Sherrerd III Memorial Award in Electrical Engineering was established in 1958 by the parents of George Sherrerd III, a graduate of the class of 1955, to recognize outstanding undergraduate scholarship. This award, consisting of the income from a fund of $5000.00 is made annually to that senior student in Electrical Engineering who, in the opinion of the Electrical Engineering faculty, has attained the highest level of scholastic achievement in all subjects and simultaneously has rendered significant service to the College of Engineering and the University at large. The recipient's name is inscribed on a plaque displayed in the Engineering Building.

The Charles Ernest Seager Memorial Award, established in 1958 by the widow and friends of Charles Ernest Seager, a graduate of the class of 1955, recognizes outstanding achievement in the annual Student Prize Paper Contest of the Duke Branch of the American Institute of Electrical and Electronic Engineers. The award consists of inscribing the name of the contest winner on a plaque displayed in the Engineering Building.

The American Society of Civil Engineers Prize consists of a certificate of award and a one year's payment of dues in the American Society of Civil Engineers. Awards are made annually by the North Carolina Chapter to the two outstanding seniors in civil engineering based on the recommendation of the faculty of the Civil Engineering Department. The basis for selection is the student's scholastic record, his contribution to the Student Chapter, and his participation in other college activities and organizations.

The Tau Beta Pi Prize. The North Carolina Gamma chapter of Tau Beta Pi, engineering national honor society, awards each year a suitable prize, such as an engineering handbook, to a sophomore student in engineering for outstanding scholastic achievement during the freshman year.

The Phi Lambda Upsilon Prize. Phi Lambda Upsilon, honorary chemical society, yearly awards a suitable prize to an outstanding junior who is majoring in chemistry. The recipient's name is inscribed on a plaque displayed in the Chemistry Library.

The Pegram Chemistry Club Prize is awarded in the spring of each year for scholarship in chemistry, physics, and mathematics. The prize consists of a one-year junior membership in the American Chemical Society and a one-year subscription to either the *Journal of the American Chemical Society* or *Industrial and Engineering Chemistry.* To qualify for this prize, the student must (1) be enrolled as an undergraduate of Duke University and (2) be taking or have taken a fourth-year chemistry course. The winner of this prize is selected by a committee consisting of at least one faculty member and at least two members of the Pegram Chemistry Club; the selection is based on the

quality-point average for all courses taken in chemistry, physics, and mathematics. In case of a tie equal awards are given.

The James B. Rast Memorial Award in Comparative Anatomy is given annually by the parents of James Brailsford Rast in memory of their son, a member of the class of 1958 at Duke University. The award, consisting of the *Atlas of Descriptive Human Anatomy* by Sobotta and bearing the James B. Rast Memorial bookplate, is given to the student who demonstrates the greatest achievement in the study of Comparative Anatomy.

The Erasmus Club Prize in the Humanities. The Erasmus Club is composed of a group of Duke faculty members interested in research in language, literature, and the arts. It seeks to stimulate interest and study in these fields. To encourage undergraduate students in this field, the Erasmus Club has established an annual prize amounting to $25.00, for the best original essay by an undergraduate which embodies the results of research, criticism, or evaluation in some subject in the humanities. Prospective competitors should consult a professor in their major field. Essays must be typewritten and must be submitted to the president of the club before the first of April. The Club reserves the right to withhold the prize in case there are no essays of acceptable quality.

The Anne Flexner Memorial Award in Creative Writing has been established by the family and friends of Anne Flexner, who graduated from Duke in 1945. It consists of fifty dollars in cash and a number of books chosen by the student. The award is given annually for the best piece of creative writing submitted by a Duke undergraduate. The competition is limited to short stories (5,000-word limit), one-act plays (5,000-word limit), poems (100-line limit), and informal essays (3,000-word limit). Only one manuscript may be submitted by a candidate, and it must be delivered to the English Office, Room 325 Allen Building, before April 15.

The William Senhauser Prize is given by the mother of William Senhauser in memory of her son, a member of the Class of 1942, who lost his life in the Pacific Theatre of War on August 4, 1944. The award is made annually to the sophomore or junior in Trinity College or the College of Engineering who has made the greatest contribution through participation and leadership in intramural sports. The winner of this prize is chosen by a committee selected by the President of the University.

The *Friends of Duke University Library* offer three prizes in an annual contest open to all undergraduate students for the best book collections acquired during their college year. The contest is supervised by the Undergraduate Committee of the Friends of the Library, which announces each fall the terms of the award. Inquiries may be directed to the Curator of Rare Books. Collections entered in the

contest are exhibited each spring in the General Library. The prizes are awarded on the basis of the student's collection, a personal interview to determine the overall planning and objectives of his collecting activity, and his familiarity with his own books and the general field of his collecting interest.

The William T. Laprade Prize in History in honor of William T. Laprade, who was a member of the History department at Trinity College and Duke University from 1909 to 1953, and chairman of the department from 1938 to 1952. This prize is awarded to that senior who is graduating with distinction and whose senior essay in history has been judged unusually meritorious.

Algernon Sydney Sullivan Award. This award is provided by the New York Southern Society. Three awards may be made each year: one to a member of the senior class of Trinity College or the College of Engineering, one to a senior in the Woman's College, and one to a member of the staff of the University or the community. "In the selection of the recipients nothing shall be considered except the possession of such characteristics of heart, mind, and conduct as evince a spirit of love for and helpfulness to other men and women."

General Academic Regulations

Trinity College and Woman's College

QUANTITY CREDIT AND COURSE LOAD: The unit of credit used is the semester hour, which signifies one class period a week throughout the semester. Two or three hours of laboratory work are equivalent to one hour of class work. Two semesters of seventeen weeks each constitute the academic year. For the degree of Bachelor of Arts or Bachelor of Science, credit for 124 semester hours is required.

Selected superior students are given the opportunity to earn credit for independent study and research in programs approved and supervised by the faculty.

The normal load for an undergraduate student is four or five academic courses totaling 14 to 17 semester hours, exclusive of physical education. The maximum number permitted is 19 semester hours, exclusive of physical education. No student is permitted to take less than 14 semester hours of work without special permission from the Dean or to take more than the normal load of work unless his average grade in the preceding semester is higher than C.

COURSE AUDIT: With the consent of the instructor, the student is allowed to audit one or more courses in addition to the normal load. After the first week of classes in any semester, no student classified as an auditor in a particular course may take the course for credit, and no student taking a particular course for credit may change classification to an auditor. Under no circumstances may a student repeat for credit any course he has previously audited. Auditors submit no daily work, take no examinations, and receive no credit for courses.

QUALITY CREDIT: The requirements for the degree are computed in semester hours and in quality points. Quality points are determined by grades as follows: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points. Credit for at least 248 quality points is required for the degree of Bachelor of Arts or Bachelor of Science.

REQUIREMENTS FOR CONTINUATION IN COLLEGE AND FOR GRADUATION FROM COLLEGE: To continue in college students must, in addition to the requirements listed elsewhere in this *Bulletin,* pass a minimum number of semester hours,

achieve a specified quality point ratio (q.p.r.), and earn a minimum number of quality points. The quality point ratio is calculated by dividing the accumulated number of quality points earned by the accumulated number of semester hours carried (not semester hours passed). These are minimum requirements for continuation in college, but do not guarantee that the student will be permitted to remain. These requirements are listed in the following table:

For continuation from	The minimum requirement is
The first to the second year	18 s.h. credit and a q.p.r. of 1.30
The second to the third year	42 s.h. credit and a q.p.r. of 1.60
The third to the fourth year	66 s.h. credit and a q.p.r. of 1.70
The fourth to the fifth year, if needed	90 s.h. credit and a q.p.r. of 1.80

For graduation the minimum requirement is 124 s.h., 248 q.p. and a q.p.r. of 1.90. Students of the senior class, in order to be eligible for graduation, must complete the work of their senior year with a minimum average grade of C.

CLASS STANDING: To rank as sophomores, students must have to their credit at least 26 semester hours and 52 quality points; as juniors, at least 56 semester hours and 112 quality points; and as seniors, at least 90 semester hours and a quality point ratio of 1.80.

Seniors may not take for graduation credit any course open primarily to freshmen without the recommendation of the Director of Undergraduate Studies of their major department and the approval of the Dean. Juniors may not take for graduation credit more than one course open primarily to freshmen without a similar recommendation and approval.

Seniors who at the beginning of a semester lack no more than 9 semester hours for the fulfillment of the requirements for the A.B. or B.S. degree may enroll, with the approval of the Dean of the Graduate School, in graduate courses for a maximum total program of fifteen hours a week.

College of Engineering

QUANTITY CREDIT AND COURSE LOAD: The unit of credit used is the semester hour, which signifies one class period a week throughout the semester. Two or three hours of laboratory work are equivalent to one hour of class work. Two semesters of 17 weeks each constitute the academic year. For the degree of Bachelor of Science in Engineering, credit for a minimum of 142 semester hours is required.

The normal load is 16-19 semester hours, exclusive of physical education. No student is permitted to take less than 14 semester hours of work without special permission from the Dean or to take more than the normal load of work unless his average grade in the preceding semester is higher than C.

QUALITY CREDIT: The requirements for the degree are computed in semester hours and in quality points. Quality points are

earned by a student on the basis of his grades: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points.

REQUIREMENTS FOR CONTINUATION IN COLLEGE AND FOR GRADUATION: To continue in college and to graduate, a student must, in addition to the requirements listed elsewhere in this Bulletin, pass a minimum number of semester hours and achieve a specified quality point ratio (q.p.r.). The quality point ratio is based solely on work performed at Duke and is calculated by dividing the total number of quality points earned by the total number of semester hours attempted at Duke. These requirements are listed in the following table:

For continuation from	The minimum requirement is
The first to the second year	18 s.h. credit and a q.p.r. of 1.30
The second to the third year	48 s.h. credit and a q.p.r. of 1.60
The third to the fourth year	78 s.h. credit and a q.p.r. of 1.70
The fourth to the fifth year, if needed	108 s.h. credit and a q.p.r. of 1.80

For graduation the minimum requirement is 142 s.h., a q.p.r. of 1.90, and a q.p.r. of 2.00 in senior work. A minimum average grade of C in all courses taken in the last year, combined with all courses designated for the senior year in the particular engineering curriculum.

ACADEMIC CLASS STANDING: *To be classified as a sophomore,* a student must have to his credit at least 22 semester hours and must have passed certain specially designated courses of the freshman engineering curriculum. *To be classified as a junior,* he must have to his credit at least 62 semester hours and must have passed certain specially designated courses of the sophomore departmental engineering curriculum. *To be classified as a senior,* he must have to his credit at least 102 semester hours and must have passed certain specially designated courses of the junior departmental curriculum.

Trinity College, Woman's College, and College of Engineering

REGISTRATION DAY: All pre-registered undergraduate students are required to return to the University on Registration Day for each semester and to report to their Dean's Offices. All students are cautioned to plan their return to the University so as to allow ample time to report to their Dean's Offices. Failure to be cleared for classes by 6:00 p.m. on Registration Day will cause students to forfeit their $25.00 registration deposits and their places in each class for which they pre-registered.

RESIDENCE REQUIREMENTS: The final four semesters—or equivalent—of work must be earned in residence except in those

instances in which a student has been approved to take his junior year abroad. For engineering students, 30 of these 60 semester hours must be from those normally taken in the senior year. Students who meet this requirement but who still lack 6 to 8 semester hours in final fulfillment of requirements may take this work in another institution of approved standing, provided the course is approved by the chairman of their major department and by the dean.

Students who complete in a summer session the work required by the University for the Bachelor's degree will be granted the degree at the end of the summer.

DISMISSAL: In addition to the qualitative standards listed above students must pass a minimum number of hours each semester. Freshmen must pass at least 6 semester hours of work in their first semester, 9 semester hours in the second semester (in engineering 3 required courses), and 18 semester hours in their first year; all other students must complete and pass at least 9 semester hours each semester. Physical education credits are excluded in each case. The University may require a student whose record is considered unsatisfactory to withdraw, although he has met the minimum requirements set forth in this paragraph.

GRADING: Final grades are reported to indicate passing or failing work in designated courses. Final grades are:

(1) *Passing.* Passing grades are A, exceptional; B, superior; C, average; and D, low pass.

(2) *Failing.* A grade of F indicates that the student has failed the course and that in order to receive credit for the course he must repeat the work in class.

Special symbols are used to indicate the following:

(1) *Absence from the final examination.* In all cases in which the student is absent from a final examination, he receives an X instead of a final grade. If he does not present an acceptable explanation for his absence to the appropriate dean's office within forty-eight hours after the scheduled time for the examination, the X is converted to an F. A student absent from examination, if the absence has been excused by the Dean, may receive an examination upon payment of a fee of $5.00 to the Treasurer of the University. The instructor concerned arranges for examination in cases where absences are excused. An X not cleared by the end of the semester following the examination missed is converted to an F.

(2) *Incomplete work.* If because of illness or other emergency a student's work in a course is incomplete, he may receive an I for the course instead of a final grade. Incomplete courses must be completed before the close of the succeeding semester; otherwise, the I is con-

verted to an F and the course must be repeated in class if the student is to receive credit for it. In case a student whose work is incomplete is also absent from a final examination, he receives an X for the course.

(3) *Withdrawal.* The letter W is used to indicate official withdrawal from a course. If a student drops a course without permission from the Dean, the grade for that course is recorded as F. If he drops with permission a course in which he is failing, the grade for that course is recorded as F unless, in the judgment of the Dean, circumstances do not justify this penalty.

(4) *Continuing course.* The letter Z is used to indicate that the student has completed one semester of a two-semester course. A final letter grade is given at the completion of both semesters of the course.

REPORTS: Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, six-weeks advisory grade reports on freshmen are mailed each semester.

ATTENDANCE REGULATIONS: The attendance regulations specifically place the responsibility for class attendance upon the individual student. A student is expected to attend his classes regularly and punctually. It should be recognized that one of the most vital aspects of a residential college experience is attendance in the classroom, and that the value of this academic experience cannot be fully measured by testing procedures alone. The members of the student body are considered sufficiently mature to appreciate the necessity of regular attendance, to accept this personal responsibility, and to demonstrate the kind of self-discipline essential for such performance; and, conversely, to recognize and accept the consequences of failure to attend. Instructors are privileged to refer to the dean for appropriate action any student who in their opinion is causing his work or that of the class to suffer because of absences or latenesses.

Absences from required classes due to illness will be excused when certified by a proper medical official. Absences from required classes due to authorized representation of the University may be excused. Officials in charge of groups representing the University are required to submit names of those persons to be excused to the appropriate dean's office forty-eight hours in advance of the hour when their absences are to commence.

EXAMINATIONS: Final examinations are held in all subjects in January and May.

TRANSFER CREDIT: Transfer credit, in which grades of C or above have been earned, is rated at two quality points per semester hour. Courses in which grades of less than C have been earned are not acceptable for transfer credit.

Credit for work completed at other institutions will be determined in relation to the curriculum requirements of the college in which the student enrolls at Duke.

Credit for courses in science or language offered for advanced standing in any of the undergraduate colleges by a transfer from a junior college will be determined by the departments concerned.

The maximum amount of credit acceptable from a junior college is 60 semester hours, exclusive of physical education. No credit is given for work completed by correspondence, and credit for no more than six semester hours is allowed for extension courses.

RECIPROCAL AGREEMENT WITH THE CONSOLIDATED UNIVERSITY OF NORTH CAROLINA: Under a plan of co-operation between the Consolidated University of North Carolina and Duke University, students regularly enrolled in the Consolidated University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester at Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students at Duke University may be admitted to course work at the Consolidated University of North Carolina.

Academic Honors

DEAN'S LIST: In recognition of academic achievement, students who earn an average quality point ratio of 3.0 or higher on a semester's work of not less than the minimum academic load are placed on the Dean's List.

CLASS SCHOLARS: The five students in each combined undergraduate class of the University (including Trinity College, The Woman's College, and the College of Engineering) who achieve the highest quality point ratio on at least a normal course load for each academic year shall be designated Class Scholars.

CLASS HONORS: To be eligible for Class Honors a student must earn, during the year, credit for at least the minimum academic load permitted by the college in which he is registered. Students in the freshman, sophomore, and junior classes who earn a 3.50 quality point ratio on all work for the year are eligible for Class Honors.

GRADUATION HONORS: To be eligible for consideration for Graduation Honors a student must have completed in residence a minimum of ninety semester hours. Students who earn an average of at least a quality point ratio of 3.50 are recommended for a degree *magna cum laude.* Those who earn a quality point ratio of 3.75 are recommended for a degree *summa cum laude.*

Honors and Other Special Programs

ADVANCED PLACEMENT: The colleges have arranged for course placement on the basis of good performance on either the Advanced Placement Examinations of the CEEB or—to a more limited extent—on placement tests given by the colleges during Orientation Week. The College Board Advanced Placement Examinations are a vehicle to sophomore-level or higher placement in botany, chemistry, English, French, German, history, Latin, mathematics, physics, Spanish, and zoology, while the Duke tests are used to decide such placement only in foreign languages and mathematics. A further distinction is that only the AP Examinations may lead to credit toward graduation for the course or courses omitted. The departmental directors of undergraduate study and the University Registrar are charged with the responsibility for evaluations leading to advanced placement of freshman matriculants.

Advanced Placement Examinations are given in May by the College Entrance Examination Board. Information regarding the tests may be obtained from the Board.

ADVANCED PLACEMENT COURSE CREDIT: Any student who has earned a score of 3 or higher on an Advanced Placement examination of the CEEB and is approved for placement in a sophomore-level course or above may be considered for course credit in appropriate subjects. For those presenting scores of 4 or 5 the award of credit will be made automatically upon matriculation; for those presenting scores of 3 it will be determined with the approval of the University department concerned, no earlier than the end of the first semester. Course credit may be granted for one or two semesters in each subject area in which examination is offered in the Advanced Placement Program.

GRADUATION WITH DISTINCTION: Programs featuring independent study and other honors opportunities are available under the title Graduation with Distinction in the majority of the academic departments. Although the details and requirements of the program vary from department to department, certain general requirements are uniform. Each department participating invites, at the end of their junior year, those students who have maintained at least a "B" average in the major field and an over-all average of "B" to enter the Graduation with Distinction Program. After participation in a senior seminar, and/or a directed course of reading, laboratory research, or other independent study, the student must embody the results of his individual research and study in a distinguished piece of writing. The paper is assessed by a departmental committee which,

if it approves, recommends that the student be Graduated with Distinction in his major field.

INDEPENDENT STUDY: Students who have a 3.0 quality point ratio overall and in their major may be permitted to enroll for independent study during their junior and senior years. The courses, numbered 191, 192 and 193, 194, are designed to permit students to pursue individual research and reading in a field of special interest subject to the supervision of a member of the staff. A student need not be in a Graduation with Distinction program to enroll in independent study courses. The maximum credit allowed for independent study and honors research courses is 3 semester hours per semester during the junior year and 6 semester hours per semester during the senior year. Interested students should consult the Director of Undergraduate Studies in the department in which they wish to work.

HONORS-MASTERS PROGRAM: This program, which is made possible partly by a grant from the Ford Foundation's Fund for the Advancement of Education, aims at the recruitment and accelerated preparation of college and university teachers. Academically superior undergraduates are selected by the Honors-Masters Committee during the spring of their sophomore year. During the junior year, these pregraduates are enrolled in Colloquium 101, 102; normally the pregraduates will be candidates for graduation with distinction in their major departments. Emphasis is also placed on the acquisition of reading knowledge of two satisfactory foreign languages prior to the beginning of graduate work. Summer school scholarships as well as a limited number of first-year graduate scholarships are available.

DISTINGUISHED PROFESSOR SEMINARS: Interdisciplinary one-semester seminars of restricted enrollment, offered to upperclassmen will be led by senior members of the faculty, usually holders of named chairs. Professors and topics are announced under the title *University Courses*. Because of their scope the seminars lie outside any particular major though a department may, at its discretion, accept one or more of them as related work. Each carries three semester hours credit.

Juniors and seniors with overall averages of at least 2.75 who meet prerequisites listed for particular seminars may apply for a seminar through the Dean of their College. Preference is given to juniors and to those not enrolled in a senior honors seminar. The selection of seminar groups is made by the moderators.

READING-OUT OF INTRODUCTORY COURSES: The option to "read" in order to by-pass introductory or pre-requisite courses is open to students of demonstrated academic ability to allow them to advance at their own pace to upper-level work. This opportunity

ensures a richer program for the student who has few places in his curriculum for electives. Any student interested in reading during the summer to by-pass an introductory or pre-requisite course must be recommended by his dean and secure the permission of the department concerned. Reading for a course and auditing are mutually exclusive procedures. A proposed program of reading should be approved by the director of undergraduate studies in the department in which the work will be done. On passing a three-hour qualifying examination prepared by the department a student may be certified for advanced course work in the area. On certification an entry will be made on his permanent record that he has passed a qualifying examination but no course credit is awarded. Interested students should request further information from their respective Dean's Offices.

STUDY ABROAD: A student contemplating study abroad should be guided by the following provisions established by the Undergraduate Faculty Council and administered by the Committee on Study Abroad.

The student should

(a) have a scholastic average of at least 2.5 (recommended);
(b) obtain prior permission to study abroad from major adviser and academic dean;
(c) receive certification from the foreign language department concerned that he can handle adequately the language of the country where he will study, provided that the language be taught at the freshman-sophomore level at Duke;
(d) obtain in advance, wherever possible, approval of his program of studies from major adviser and academic dean.

If the student wishes to transfer credit to Duke and

(a) is participating in a program sponsored by an American group, the group must have been approved by the above committee and the program he proposes must meet the qualifications of the sponsoring group

or (b) studies abroad under his own sponsorship, work to be considered for transfer must be done in the language in which courses are normally given in the institutions attended.

SUMMER STUDY ABROAD. Duke University, in co-operation with the Experiment in International Living, runs a summer program of study abroad in France, Germany, and Spain, open to all qualified Duke students. The program offers the opportunity to earn 6-8 hours of academic credit. Participants are selected by the Committee on Study Abroad and the Experiment in International Living. Applications must be submitted before February 15 to qualify for the following summer group.

Other Regulations

CONDUCT AND DISCIPLINE: The University expects of its students loyal and hearty cooperation in developing and maintaining high standards of conduct as well as of scholarship. General University regulations concerning conduct of students are made available to students when admission is offered, or upon request. The student in accepting admission indicates his willingness to subscribe to those regulations. The University reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory to the University, even though no specific charge may be made against the student.

General oversight of the conduct of students and the administering of discipline are under the supervision of appropriate deans. Immediate supervision is entrusted to the Dean of Men and the Dean of Women. However, through the expressed willingness of the students of the University to assume the responsibility of maintaining high standards of morality, the student body has become to a great degree self-governing. Two councils, one of men and the other of women, each composed of duly elected representatives of the student body, exercise the authority granted the students by their respective colleges to investigate all cases of misconduct, as well as all other cases of violation of proper standards and traditions, and to make recommendations of penalities based on their finding. They exert a guiding and stimulating influence for the promotion of high ideals of conduct among students.

MOTOR VEHICLES: Freshmen are not permitted to own or operate motor vehicles at the University. In accordance with University regulations members of the upper classes of Trinity College and the College of Engineering and seniors in the Woman's College may operate motor vehicles.

Students permitted to operate motor vehicles must register them annually at the beginning of the fall semester, or if the vehicle is acquired later, within five days after bringing it to the campus. Students must show a state vehicle registration and a state operator's license. A standard certificate of automobile liability insurance, issued by a recognized company and evidencing coverage of at least $5,000 per person and $10,000 per accident for personal injury and $5,000 for property damage is also required. There is a registration fee of $30.00 per vehicle for each academic year.

Students under 21 years of age must have the written consent of parent or guardian before operating a motor vehicle at Duke.

SCHOLASTIC REGULATIONS FOR PARTICIPATION IN ATHLETICS AND OTHER ACTIVITIES: Members of athletic teams or other student groups engaging in public representation of the University are expected to be carrying their current work satisfactorily. Students may be barred from participation in such representation if, in the opinion of the dean of their college, they fail to meet this requirement.

ENROLLMENT AND REGISTRATION: Students in residence are required to submit, not later than the date of the spring registration, cards showing their selection of courses for the following year. Evidence of the payment of the continuing pre-registration deposit of $25.00 (see page 20 for detailed information) is required before the card may be submitted. These cards are filed for permanent record in the Central Records Office. Students who do not select their courses for the following year at the appointed time must be readmitted to the college by application to the Director of Admissions. Each student planning to continue enrollment for the following year must apply for a room or obtain permission to live off campus prior to the end of the spring semester. Students whose course cards have been approved in the spring may enroll by mail during the summer. The same regulations, with the exception of the advanced deposit, apply to registration for the spring semester.

Students who register in either semester at a date later than that prescribed in the Calendar of the Colleges must pay to the Treasurer a fee of $5.00. Changes in courses for reasons not arising within the University require a payment of $1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

READMISSION OF FORMER STUDENTS: A student who desires to return, following withdrawal from college, should apply to the Director of Admissions, and send a detailed statement of his activities since withdrawal. If practicable, the student should arrange for an interview with the Dean of his college.

TRANSCRIPTS: Requests for transcripts should be directed to the Office of the Registrar. Ten days should be allowed for processing. One transcript is issued free of charge. Additional copies are supplied at $1.00 each.

Requirements for Degrees

DUKE UNIVERSITY offers in Trinity College and the Woman's College, courses of study which lead to the degrees of Bachelor of Arts and Bachelor of Science; and in the College of Engineering, the degree of Bachelor of Science in Civil, Electrical, or Mechanical Engineering.

Bachelor of Arts

The requirements for the degree of Bachelor of Arts are based on the principle that the student will derive the maximum benefit from his college work if his program includes a broad distribution of studies among representative fields of culture, concentration within a special field, and some work of his own choice.

For graduation with the degree of Bachelor of Arts, the following course work must be completed in accordance with the academic regulations as stated in this *Bulletin*.

Uniform Course Requirements	s.h.
English	6
Foreign Language	6–18
Natural Science	8
Formal Science	3
Religion	6
Social Science and History	12
Humanities	12
Physical Education	4
Major and Related Work	42
Electives to Make a Total of	124

These requirements are described in detail below.

ENGLISH, 6 s.h.—This requirement is met by the completion of English 1-2.

FOREIGN LANGUAGE.—The languages which meet this requirement are French, German, Greek, Latin, Russian, and Spanish. This requirement is fulfilled by one of the following: 1.) a passing grade in French 64, German 92 or equivalent, Greek 106 or 108, Latin 92, Russian 64 or Spanish 64; 2.) a satisfactory score on the placement test, plus a validating year (two literature courses numbered 90 or above); 3.) passing a proficiency examination. (The proficiency examination can be taken only by students who have been enrolled in language work in the University and is not available to entering Freshmen.) Students presenting for entrance four units of Latin may satisfy the language requirements by the completion of the third college year of Latin or two years of Greek.

Students enrolled during the fall of 1962 in a language course numbered 63 or above are controlled by the regulations published in the 1960-61 *Bulletin*.

NATURAL SCIENCE, 8 s.h.—To satisfy this requirement a student must complete a laboratory course in one of the natural sciences (botany, chemistry, geology, physics, or zoology).

FORMAL SCIENCE, 3 s.h.—One course of at least 3 semester hours selected from mathematics (except Mathematics 11), logic and scientific methodology (Philosophy 48, 103 and 104).

RELIGION, 6 s.h.—This requirement may be met in one of the following ways: (a) by completing, in the freshman year, Religion 1-2; (b) by completing, in the sophomore year or later, Religion 51-52; (c) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99.

SOCIAL SCIENCE AND HISTORY, 12 s.h.—To satisfy this requirement a student must complete 12 semester hours in two departments from the following basic courses: Economics 51-52; Education 54-104; History 1-2, or 51-52; Political Science 11-12, or 61-62; Psychology 91, to be followed by either Psychology 100 or 101; Sociology 91-92, or 93-94. (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

HUMANITIES, 12 s.h.—To satisfy this requirement a student must complete 12 semester hours from the following courses, with six hours in each of two divisions: (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

I. Literature: English 55-56, 57-58; Greek 121, 122; Latin 111, 112; all foreign language literature courses above 100 not given in translation.
II. Philosophy 41-42, 93-94.
III. Art and Music: Art 1-2, 51-52; Music 1-2, 51-52.

PHYSICAL EDUCATION, 4 s.h.—Physical education is required during each of the first two years and is normally completed by the end of the sophomore year.

MAJOR IN RELATED WORK, 42 s.h.—Prior to registration in the spring of his sophomore year, each student is required to choose his major field and confer with his departmental adviser about the requirements for major and related work.

The major work consists of 18 to 24 semester hours in one department above the introductory courses. Introductory courses consist of two one-semester courses in all departments except the departments of Economics and Business Administration, German, Latin, Music, and Romance Languages, in which the introductory courses may consist of four one-semester courses. The choice of courses must be approved by the major department. Whenever the department defines the major as 24 hours above the introductory courses, the student, with the prior approval of the Director of Undergraduate Studies, may substitute 6 hours of advanced work normally taken by a major in a related discipline during his junior or senior year. Eighteen hours of related work must be taken in at least two other departments and is selected subject to the approval of the major department and the dean of the appropriate college; it may not include more than one course of 6 or 8 semester hours open primarily to freshmen. With the consent of the department, however, majors in mathematics, the natural sciences, and science education may include as related work introductory courses in mathematics and the natural sciences. Although courses satisfying the uniform course requirements may also be counted toward the requirements in major and related work, no student may satisfy two uniform course requirements with the same course.

ELECTIVES.—In addition to the uniform courses required and the major and related work, other courses must be completed to make a total of at least 124 semester hours, including 4 semester hours of physical education.

Students whose courses of study permit may elect a maximum of 18 semester hours in engineering, forestry, or medical science. The courses elected in these subjects must be approved by the major department and the dean of the appropriate college.

CHOICE OF A MAJOR FIELD

The requirement of 42 semester hours distributed, as specified above, between a major field and related work is based primarily on the belief that some advanced study in one subject, together with work in allied subjects is a valuable part of a general education. The

selection of a major field usually depends on a student's cultural or vocational interests.

GENERAL PROGRAM

The General Program is designed for the student whose primary interest is in one of the liberal arts subjects. The subjects in which major work is offered are: art, botany, chemistry, economics, education, English, French, geology, German, Greek, history, Latin, mathematics, music, philosophy, physics, political science, psychology, religion, Russian, sociology, Spanish, zoology.

SPECIALIZED PROGRAMS

A student who has chosen a particular field may wish to take more course work in a major or related discipline than is required by his major department. The following programs of study offer a guide in planning this work, especially as it applies to preparation for various professions or professional schools.

UNDERGRADUATE PROGRAMS

ACCOUNTING: A student may specialize in public or industrial accounting in his Junior and Senior years. In either case the following courses should be taken in the Freshman and Sophomore years:

Freshman Year: Mathematics 17 or 21. (Preferably Mathematics 21)
Economics 1 and 2
Sophomore Year: *Economics 51-52, 57-58, 138
* If Economics 1 and 2 not taken in Freshman year.

Public Accounting

The following sequence of courses includes more than the requirement for a major in accounting. It is, however, a suggested list of courses which meet the current requirements of the North Carolina Board of Certified Public Accountants.

Junior Year	*Senior Year*
Ec. 143—Corporation Finance	Ec. 273, 274—Auditing Theory and Practice
Ec. 146—Managerial Economics	Ec. 275, 276—Advanced Industrial Accounting and Management
Ec. 171—Accounting Theory	Ec. 277—Income Tax Accounting
Ec. 172—Corporate Accounts	Ec. 295—Advanced Accounting Seminar
Ec. 181—Business Law	
Ec. 182—Business Law	

Election of one of the following: (either year)

Ec. 178—Accounting Systems
Ec. 180—Governmental Accounting
Ec. 184—Commercial Law for Accountants
Ec. 278—Advanced Problems in Income Taxation
Ec. 279—Budgeting and Control
Ec. 296—Advanced Accounting Seminar

Industrial Accounting

Junior Year	*Senior Year*
Ec. 143—Corporation Finance	Ec. 273—Auditing, Theory and Practice
Ec. 146—Managerial Economics	Ec. 275, 276—Advanced Industrial Accounting and Management
Ec. 171—Accounting Theory	Ec. 277—Income Tax Accounting
Ec. 172—Corporate Accounts	Ec. 291—Business Policy

Business: A specialized program is offered to students planning to enter business. A student electing this program must take, in addition to the uniform course requirements, the following courses in the sequence indicated.

Freshman Year:	Mathematics 17 or 21 (Preferably Mathematics 21) Economics 1 and 2
Sophomore Year:	Economics 51 and 52 (If Economics 1 and 2 not taken in Freshman year) Economics 57, 58, Economics 138
Junior Year:	Economics 143, Economics 146, *Economics elective
Senior Year:	*Economics Elective, Economics 291

* These electives must be chosen from the following courses:
Economics 144, Economics 185, Economics 190, Economics 249

Music Education: The following course sequence is designed for prospective teachers of high school instrumental or vocal music. Although it includes more than the number of hours required for a major in music, it represents those courses recommended by the Music Department for state certification: Music 51-52, 65-66, 115-116, 121-122, 147-148, 3 additional semester hours in Music Literature, and 18 semester hours in Applied Music.

Other areas of concentration in music are described on pages 101-106 of this *Bulletin*.

Teaching: Duke University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers.

The program for students who intend to teach is designed to prepare for positions either in elementary or secondary schools. All prospective teachers must take Psychology 91, preferably during the sophomore year, and Education 100 or 113 preferably during the junior year. Only students with an average of 2.0 overall and in their major or teaching fields will be admitted to student teaching. Special methods courses should be taken prior to undergraduate student teaching, which may be done *only* in the senior year.

Whatever their majors, students should consult an appropriate member of the Department of Education prior to each registration period to assure their meeting the certification requirements of the states in which they wish to teach and having places reserved for them in student teaching.

Elementary-School Teaching. Students preparing to teach in the

elementary school must complete the following specific requirements in addition to Psychology 91 and Education 100 or 113: Education 101, 102, 105, 106, 107, 108, 118, and 161; Art 51-52; Economics 115 or 120; History 91, 92; Music 151, 152; Health Education 134; Political Science 61; and Physical Education 102.

Secondary-School Teaching. Students preparing to teach in a secondary school may meet certification requirements by qualifying in one teaching subject, but they are strongly advised to choose courses that meet requirements in two teaching subjects. Prospective secondary-school teachers must major in a subject other than education. Qualification for certification to teach a single science may be sought under either the A.B. or the B.S. degree.

Science Education Major. Students who intend to teach sciences in the high school may major in Science Education. The program is designed to meet certification requirements and to provide the broad background of preparation in the sciences which is needed by science teachers. Students planning to enter this program should consult an adviser in the Department of Education and in one of the science departments. The basic requirements are: Education 100, or 113, 118, 215, 216, and 276 or 246; Mathematics 21 and 22; Sciences (botany, chemistry, geology, physics, zoology, and mathematics above 22), 42 s.h., of which 15 must be above introductory level and which must include one year's study in laboratory courses in three of the following: botany or zoology, chemistry, physics, and geology.

The same major program may be followed under the B.S. uniform course requirements leading to a B.S. degree.

Preparation for Graduate and Professional Schools

Many graduate and professional schools require special tests for students seeking admissions. Information regarding the test requirements should be obtained from the catalogue of the schools to which the student plans to apply. The University Counseling Service has available applications for required graduate and professional testing programs.

Graduate School: The student who plans to enter a graduate school of arts and sciences for advanced study should consult an adviser in the field of the proposed advanced study concerning suitable preparation. Most graduate schools have definite requirements in foreign languages for all students. Candidates for the degree of Doctor of Philosophy are required to pass reading examinations, usually in German and French. In some cases other languages may be substituted. As soon as practicable, the student should ascertain the requirements of the particular graduate school he desires to enter.

Medical and Dental Schools: Students planning to enter a medical or dental school should arrange their programs of study from the first semester so as to include those courses required by the professional schools of their choice. These courses usually include two years of English, two years of chemistry, and one year each of biology, mathematics, and physics. At Duke University the courses normally taken are English 1-2 and 55-56, Chemistry 1, 2, 61, 151, and 152, Zoology 1 and 2, Mathematics 21-22, and Physics 41-42. Most professional schools require ninety semester hours of college credit before consideration for admission. Because individual medical and dental schools strongly recommend, or, in some case, require specific courses in addition to those listed above, it is wise for the student to be fully aware of any additional requirements established by the professional school of his choice.

The minimum uniform course requirements and those of the major and its related work for either the A.B. or B.S. degree must be fulfilled for graduation. The latter requirements are described for each department under Courses of Instruction in this *Bulletin*. Each student may elect to major in the department of his choice, but should understand that even with careful program planning starting his first semester, it may be necessary to exceed the 124 semester hours required for graduation.

The pre-professional student usually registers for the following program during his first year:

English 1-2.
Mathematics 21-22.
*Two laboratory sciences.
†Uniform requirement.
Physical Education 1-2.

Law Schools Students who plan to prepare for Law School may select their major work in any field. The following courses are recommended:

Economics 51-52, 57, 58.
English 55-56.
History 1-2 or 51-52, 105-106.
Philosophy 48 and 41.
Political Science 61-62.
Sociology 91-92.

Theological Schools and Religious Work: A student who plans to enter the ministry or follow some other professional Christian vocation should have a broad liberal arts background. Recommended majors are English, history, philosophy, religion, and one of the social

* The student planning to enter medical or dental school who elects only one laboratory science should begin the foreign language sequence the first year.

† Programs of the first two years should normally be completed with courses which fulfill minimum uniform requirements. Electives are limited and should be postponed until late in the program.

sciences. It is desirable that the student include the following in his program:

English: 12-18 s.h. (including English 55, 56).
History: 6-12 s.h.
Philosophy: 6-12 s.h. (including Philosophy 93, 94).
Social Sciences (other than history): 6-12 s.h.

These suggestions are in harmony with the recommendations of the American Association of Theological Schools for undergraduate courses of study.

Bachelor of Science

For graduation with the degree of Bachelor of Science, the following course work must be completed in accordance with the academic regulations as stated in this *Bulletin*.

UNIFORM COURSE REQUIREMENTS	S.H.
English	6
Foreign Language	8–24
Mathematics	6
Natural Science	8
Social Science and History	6
Religion	6
Humanities	6
Physical Education	4
MAJOR AND RELATED WORK	48
ELECTIVES TO MAKE A TOTAL OF	124

These requirements are described below.

ENGLISH, 6 s.h.—This requirement is met by the completion of English 1-2.

FOREIGN LANGUAGE.—Bachelor of Science candidates must complete the second college year, or equivalent as determined by examination, of one foreign language, and the first college year of another. The languages submitted will be determined by the major department. Students enrolled, during the fall of 1962, in a language course numbered 63 or above are controlled by the regulations published in the 1960-61 *Bulletin*.

MATHEMATICS, 6 s.h.—This requirement may be met by completion of Mathematics 21 and 22.

NATURAL SCIENCE, 8 s.h.—This requirement can be satisfied by courses in one of the natural sciences, namely, botany, chemistry, geology, physics, and zoology. The courses must include laboratory work.

SOCIAL SCIENCES AND HISTORY, 6 s.h.—This requirement can be satisfied by either of the following 6-hour sequences; Economics 51-52; Education 54-104; History 1-2, or 51-52; Political Science 11-12 or 61-62; Psychology 91, to be followed by either Psychology 100 or 101; Sociology 91-92, or 93-94. (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

RELIGION, 6 s.h.—This requirement may be met in one of the following ways: (a) by completing, in the freshman year, Religion 1-2; (b) by completing, in the

sophomore year or later, Religion 51-52; (c) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99.

HUMANITIES, 6 s.h.—This requirement can be satisfied by 6 hours from the following: English 55-56, 57-58; Greek 121, 122; Latin 111, 112; all foreign language literature courses above 100 not given in translation; Philosophy 41-42, 93-94; Art 1-2, 51-52; Music, 1-2, 51-52. (Double numbered courses separated by a hyphen do not meet this requirement unless both courses are completed.)

PHYSICAL EDUCATION, 4 s.h.—Physical education is required during each of the first two years and is normally completed by the end of the sophomore year.

MAJOR AND RELATED WORK, 48 s.h.—Major and related work consists of at least 48 semester hours in the natural sciences. This work must be selected from the departments of botany, chemistry, geology, mathematics, physics, psychology, and zoology. The major work consists of a minimum of 18 semester hours in one department above the introductory courses. The choice of courses is subject to the approval of the department. Whenever the department defines the major as 24 hours or more above the introductory courses, the student, with the prior approval of the director of undergraduate studies, may substitute 6 hours of advanced work normally taken by a major in a related discipline during his junior or senior year. The related work is taken in at least two other departments and is selected subject to the approval of the major department. With the consent of the department, majors in mathematics and the natural sciences may include as related work introductory courses in mathematics, the natural sciences, and science education. A minimum of 14 semester hours of related work is required, 8 hours of which must be in laboratory science. Although courses fulfilling the uniform course requirements may also be counted toward the requirements in major and related work, no student may satisfy two uniform course requirements with the same course.

ELECTIVES.—In addition to the above, the student must elect sufficient courses to complete the 124 semester hours necessary for graduation.

Students whose courses of study permit may elect a maximum of 18 semester hours in engineering, forestry, or medical science. The courses elected in these subjects must be approved by the major department and the dean of the college.

On or before the date announced for the spring registration, every sophomore in this group should select his major department in the natural sciences and arrange, under the guidance of an adviser in the major department, his program of studies for the following year. He should obtain the adviser's written approval of all courses selected in the division before submitting his program to the dean for final action. In like manner, each upperclassman will recheck the courses in his division of concentration each year with a representative of his major department.

Bachelor of Science in Civil, Electrical, or Mechanical Engineering

The College of Engineering offers fully accredited four-year programs in civil, electrical, and mechanical engineering leading to the degrees of B.S. in C.E., B.S. in E.E., or B.S. in M.E.

GROUPS OF STUDIES FOR THE DEGREE OF BACHELOR OF SCIENCE IN CIVIL, ELECTRICAL, OR MECHANICAL ENGINEERING

The engineering curricula are undergoing thorough restudy and re-evaluation, hence the three programs which follow are subject to modification for the academic year 1965-66.

§*Uniform Freshman Year*

FIRST SEMESTER			S.H.
Chem	1	Gen. Inorg. Chemistry	4
Engrg	1	Engineering Design I	2
Engl	1	English Composition	3
Hist	1	Modern History	3
Math	21	Introductory Calculus	3
PE		Physical Education	1
			*16

SECOND SEMESTER			S.H
Chem	2	Gen. Inorg. Chemistry	4
Engrg	2	Engineering Design II	2
Engl	2	English Composition	3
Hist	2	Modern History	3
†Math	22	Introductory Calculus	3
PE		Physical Education	1
			*16

CIVIL ENGINEERING

Sophomore Year

FIRST SEMESTER			S.H.
†CE	61	Surveying	5
Engrg	57	Statics	3
Math	63	Intermediate Calculus	3
Phys	41	General Physics	4
‡Approved Elective			3
PE		Physical Education	1
			19

SECOND SEMESTER			S.H.
CE	72	Materials Laborarory	1
†Engrg	107	Mechanics of Materials	3
Engrg	109	Mech. of Materials Lab.	1
Engl	93	Technical Communication	3
Math	64	Intermediate Calculus	3
Phys	42	General Physics	4
‡Approved Elective			3
PE		Physical Education	1
			19

Junior Year

FIRST SEMESTER			S.H.
CE	118	Engrg. Materials	2
†CE	131	Structural Mech. I	3
Engrg	115	Dynamics	3
Engrg	128	Fluid Mechanics	3
ME	103	Thermodynamics	3
ME	116	ME Laboratory	1
‡Approved Elective			3
			18

SECOND SEMESTER			S.H.
CE	113	Route Surveying	2
†CE	123	Hydraulic Engrg.	3
CE	133	Reinforced Concrete	3
EE	123	EE Fundamentals	3
EE	125	EE Fundamentals Lab.	1
‡Approved Electives			6
			18

Senior Year

FIRST SEMESTER			S.H.
CE	101	Soil Mech. Lab.	1
CE	124	Sanitary Engrg.	3
CE	132	Structural Design	4
CE	135	Soil Mechanics	2
CE	146	Professional Engrg.	2
‡Approved Electives			6
			18

SECOND SEMESTER			S.H.
CE	116	Transportation	3
CE	140	Structural Mechanics II	3
CE		Elective	3
‡Approved Electives			9
			18

§There is a single, common program in the Freshman Year; final choice of a department is not made until the time of registration for the sophomore year.

†Courses which must be passed before engineering academic standing can be advanced.

*Freshman engineering students taking Air Science or Naval Science will schedule certain courses in addition to the 16 semester hours prescribed for each semester.

‡Part of a program of 30 semester hours of electives planned with departmental approval to suit the interests and abilities of each student. The program will include three semester hours of mathematics beyond calculus; an additional nine semester hours in mathematics, the sciences, or other technical subjects; and another 15 semester hours in the humanities or the social sciences, including six semester hours of either economics or political science.

A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering All other credits earned in Air Science and Naval Science are taken in addition to the minimum program.

ELECTRICAL ENGINEERING

Sophomore Year

FIRST SEMESTER			S.H.
Econ	51	Principles of Economics	3
EE	53	E. E. Fundamentals	1
EE	55	Electric Networks I	4
Engl	93	Technical Communication	3
Math	63	Intermediate Calculus	3
Phys	41	General Physics	4
PE		Physical Education	1
			19

SECOND SEMESTER			S.H.
Econ	52	Principles of Economics	3
†EE	56	Electric Networks II	4
Engrg	60	Engineering Mechanics	4
Math	64	Intermediate Calculus	3
Phys	42	General Physics	4
PE		Physical Education	1
			19

Junior Year

FIRST SEMESTER			S.H.
EE	109	Electromagnetic Systems	4
EE	111	Electrical Prin. Lab.	2
Engrg	107	Mechanics of Materials	3
Math	111	Applied Math Analysis I	3
Phys	161	Modern Physics	3
‡Approved Elective			3
			18

SECOND SEMESTER			S.H.
†EE	110	Electromagnetic Systems	4
EE	112	Electrical Prin. Lab.	1
Engrg	128	Fluid Mechanics	3
Math	112	Applied Math Analysis II	3
ME	103	Thermodynamics	3
ME	116	M. E. Laboratory	1
‡Humanities-Social Studies Elective			3
			18

Senior Year

FIRST SEMESTER			S.H.
EE	165	Seminar	1
EE	181	Electronic Networks	3
EE	183	Electronics Laboratory	1
EE	191	Electric Machinery	3
EE	193	Energy Conversion Lab.	1
‡EE Elective			3
‡Approved Elective			3
‡Humanities-Social Studies Elective			3
			18

SECOND SEMESTER			S.H.
EE	166	Seminar	1
EE	182	Electronic Networks	3
EE	184	Electronics Laboratory	1
EE	192	Electric Machinery	3
EE	194	Energy Conversion Lab.	1
‡Approved Elective			3
‡Approved Elective			3
‡Humanities-Social Studies Elective			3
			18

†Courses which must be passed before engineering academic standing can be advanced.

‡Part of a planned program of electives to be chosen in consultation with the adviser. A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering. All other credits earned in Air Science and Naval Science are taken in addition to the minimum program.

MECHANICAL ENGINEERING

Sophomore Year

FIRST SEMESTER			S.H.
Engrg	60	Engineering Mechanics	4
Math	63	Intermediate Calculus	3
ME	52	Kinematics Kinetics	3
Phys	41	General Physics	4
‡Humanities-Social Studies Elective			3
PE		Physical Education	1
			18

SECOND SEMESTER			S.H.
Engrg	107	Mechanics of Materials	3
Engrg	109	Materials Laboratory	1
†Math	64	Intermediate Calculus	3
ME	105	Dynamics of Fluids	3
Phys	42	General Physics	4
‡Humanities-Social Studies Elective			3
PE		Physical Education	1
			18

Junior Year

FIRST SEMESTER			S.H.
EE	123	Fundamentals of E.E.	3
EE	125	Elec. Fundamentals Lab.	1
Math	111	Applied Math Analysis I	3
ME	101	Thermodynamics	3
†ME	106	Heat Transfer	3
ME	141	Machine Design	3
‡Humanities-Social Studies Elective			3
			19

SECOND SEMESTER			S.H.
EE	124	Industrial E. E.	3
EE	126	Industrial Elec. Lab.	1
Engl	93	Technical Communication	3
Math	112	Applied Math. Analysis II	3
†ME	102	Thermodynamics	3
ME	114	M. E. Laboratory	2
†ME	142	Machine Design	3
			18

Senior Year

FIRST SEMESTER			S.H.
Econ	51	Principles of Economics	3
ME	59	Materials and Processes	3
ME	159	M. E. Laboratory	1
ME	171	Response of Phys. Systems	3
ME	173	Seminar	1
ME		Elective	3
‡Approved Electives			6
			20

SECOND SEMESTER			S.H.
ME	156	Combustion Engines	3
ME	160	M. E. Laboratory	1
ME	162	Power Plants	3
ME	174	Seminar	1
‡Approved Electives			6
‡Humanities-Social Studies Elective			3
			17

†Courses which must be passed before engineering academic standing can be advanced.

‡The electives form a planned program to be chosen in consultation with the adviser. A maximum of nine semester hours of junior and senior level Air Science or Naval Science course work may be counted as "Approved Electives" in satisfying the minimum requirements for a baccalaureate degree in engineering. All other credits earned in Air Science and Naval Science are taken in addition to the minimum program.

Academic-Professional Courses

The provision whereby a senior may elect the work of the first year in a professional school of the University shall apply solely to eligible students in Trinity College or the Woman's College. The privilege of completing a combined course for the degree is conditioned upon admission to the professional school at the close of the junior year. A student thus admitted registers as a senior in college and as first-year student in the professional school.

ACADEMIC-FORESTRY COMBINATION

Pre-professional training in forestry is offered to students of Trinity College who are planning careers in professional forestry. A student who has completed the 3-year program of students in the liberal arts and sciences outlined below, and who has earned an average grade of C or higher (exclusive of physical education) may, with the approval of the Deans of Trinity College and the School of Forestry, respectively, transfer to the School of Forestry. Upon the satisfactory completion of the forestry course requirements in the Summer Session, and those required in the first year in the School of Forestry (see *Bulletin of the School of Forestry*) the student will be eligible for the degree Bachelor of Science from Trinity College, Duke University.

The professional degree of Master of Forestry may be earned upon satisfactory completion of the work of the second year in the School of Forestry.

Students wishing information concerning admission to the School of Forestry are invited to consult with the Chairman of the Committee on Admissions of that school.

The program of studies in preparation for admission to the School of Forestry under this combination program includes the following:

	S.H.
Uniform Course Requirements for the B.S. Degree	48–66
Additional Required Courses	24–26
Electives to Make a Total of	94
Summer Field Work	12

Uniform Course Requirements: These requirements are described in the Requirements for the Bachelor of Science degree in this *Bulletin*. French, German, Russian, or Spanish may be used to fulfill the foreign language requirement. The natural science requirement is met by completion of Botany 1-2. The social science and history requirement is met by completion of Economics 51-52.

Additional Required Courses:

	S.H.
Chemistry 1-2	8
Engineering Drawing 1-2	4
Geology 51	4
Physics 1-2	8
	24

Electives: The electives are normally chosen from botany, chemistry, economics, mathematics, and philosophy. A minimum of 94 semester hours must be obtained, exclusive of summer field work, to meet uniform course requirements, additional required courses, and electives.

Summer Field Work: This work of 11 weeks, to be taken upon completion of the junior year, includes:

	S.H.
Dendrology (F. 141)	3
Forest Surveying and Aerial Photo Interpretation (F. 150)	4
Forest Mensuration (F. 151)	4
	11

Trinity College students in this combination are encouraged to consult with the special adviser for students in Academic Forestry Combination. The name of this adviser may be obtained at the School of Forestry office.

ACADEMIC-LAW COMBINATION

A student who has completed, with an average grade of C or higher, 96 semester hours of undergraduate work, including the uniform course requirements for the degree of Bachelor of Arts and the work of the junior year in his major and related fields, may, with the approval of the dean of the college, transfer to the Duke University School of Law and be eligible for the degree of Bachelor of Arts from Duke University upon the satisfactory completion therein of the work of the first year.

It is understood that this provision shall apply solely to eligible undergraduates who have completed three years in residence in Duke University, and that not less than the full first-year's work of the Law School will be acceptable for credit towards the bachelor degree.

No single discipline or program of study can be described as the best preparation for the study of law since there are various methods of approach to legal study.

Completion of the undergraduate work necessary to qualify for the Academic-Law Combination does not insure admission to the Duke University School of Law, nor impose any restriction whatever upon its freedom in selecting students for admission. Students wishing further information are invited to consult with the Dean of the School of Law.

Courses of Instruction

Trinity College and the Woman's College

NOTE: Courses primarily for freshmen are numbered from 1 to 49; those primarily for sophomores are numbered from 50 to 99; those primarily for juniors and seniors from 100 to 199; those primarily for seniors and graduates from 200 to 299. The amount of credit for each course is given in semester hours following the description of the course.

The designation of (W) or (E) indicates that the course is to be given on the West Campus or on the East Campus. Odd-numbered courses are usually offered in the fall semester; even-numbered courses in the spring semester. *For courses which will be offered in 1964-65, consult the Official Schedule of Courses available to enrolled students in the Registrar's Office.*

Double numbers separated by a hyphen indicate that the course is a year-course and must normally be continued throughout the year if credit is received. A student must secure written permission from the instructor in order to receive credit for either semester of a year-course. Double numbers separated by a comma indicate that although the course is a year-course credit may be received for either semester without special permission.

AEROSPACE STUDIES

PROFESSOR SCHLÖGL, LT. COLONEL, USAF, CHAIRMAN; ASSOCIATE PROFESSOR OLDHAM, MAJOR, USAF, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSOR WILSON, MAJOR, USAF

ELIGIBILITY REQUIREMENTS.—Freshmen enrolled in Trinity College and the College of Engineering are eligible to enroll in the Basic Course in the Air Force ROTC. For enrollement in the Advanced Course the student must have successfully completed either the Basic Course or the six weeks Field Training Course, or have had at least one year of honorable service in the Armed Forces of the United States; must execute a written agreement with the government to complete the Advanced Course; must be sworn into the Enlisted Reserve, and he must agree to accept a commission in the United States Air Force Reserve upon graduation

DEPOSIT REQUIRED.—Each student must make a deposit of twenty dollars with the University Treasurer to insure return of all Government Property.

COURSE OF STUDY.—The course of study of AFROTC is composed of courses in the Department of Aerospace Studies. In addition to classroom instruction, the Air Force requires Leadership Laboratory each semester.

BASIC COURSES

First Year Basic

AS 1. LEADERSHIP LABORATORY

AS 2. DEFENSE OF THE UNITED STATES.—A study of the causes of world conflict, the problem of United States security, and the role of the armed forces as instruments of national policy. 2 s.h. (W) WILSON

Second Year Basic

AS 51. WORLD MILITARY SYSTEMS.—A comparative study of free world military forces, Communist Military Systems, and trends in the development and employment of military powers. 2 s.h. (w) WILSON

AS 52. LEADERSHIP LABORATORY

ADVANCED COURSES

All students selected to continue Aerospace Studies pursue:

First Year Advanced

AS 101, 102. GROWTH AND DEVELOPMENT OF AEROSPACE POWER.—A study of development of aerospace power in the United States; mission and organization of the Defense Department; Air Force concepts, doctrine and employment; astronautics and space operations; future development of aerospace power. Leadership Laboratory is required. 6 s.h. (w) SCHLÖGL

Second Year Advanced

AS 203. THE PROBLEMS OF FLIGHT AND THE AEROSPACE SCIENCES OF WEATHER AND NAVIGATION are studied. For pilot and navigator cadets, elective for all others. 1 s.h. (w) OLDHAM

AS 205, 206. THE PROFESSIONAL OFFICER.—Studies of the principles of leadership and their professional application in combat and managerial situations. Final portion of the second semester is devoted to the Military Justice system. Leadership Laboratory is required. 6 s.h. (w) OLDHAM

ART

ASSOCIATE PROFESSOR MUELLER, CHAIRMAN, PRO TEM; ASSOCIATE PROFESSOR JENKINS, DIRECTOR OF UNDERGRADUATE STUDIES; ADJUNCT PROFESSOR BIER; PROFESSORS HALL AND PATRICK; ASSOCIATE PROFESSORS BRODERSON, MARKMAN, AND SUNDERLAND; VISITING INSTRUCTOR HANNEGAN; MESSRS. STARS AND PRATT

AESTHETICS

121. THE PRINCIPLES OF ART CRITICISM.—The development of criteria for making sound critical judgments based on analyses of painting, sculpture, architecture, and design. 3 s.h. (E) PATRICK

221-222. HISTORY OF AESTHETICS.—Theories of art and beauty in the western world from antiquity to the present. Some attention will be given the development theories of aesthetics in the Far East. 6 s.h. (E) PATRICK

HISTORY OF ART

1-2. INTRODUCTION TO ART HISTORY.—An historical survey of the development of architecture, sculpture, painting, and the minor arts as material manifestations of the culture of the western world from ancient to modern times, with some reference to primitive, Oriental, and other non-western culture; the visual arts as a record of a whole civilization. The course will provide the student with terminology and principles necessary to formation of judgment. Open only to freshmen; others, see Art 51-52. 6 s.h. (E & W) STAFF

51-52. INTRODUCTION TO ART HISTORY.—The aims of this course are identical with those of Art 1-2; the content and method are adapted to the capacities of upperclassmen. Not open to upperclassmen who have received credit for Art 1-2. 6 s.h. (E & W) STAFF

131. ART AND ARCHAEOLOGY OF THE HELLENIC WORLD.—After a preliminary treatment of the archaeological material from the Aegean, the geometric and orientalizing periods, the course deals with the architecture, sculpture and vase paintings of ancient Greece from archaic through Hellenistic times. 3 s.h. (W) MARKMAN

132. ROMAN ART AND ARCHAEOLOGY.—The course opens with a treatment of the archaeological background for the formation of the Roman style as derived from Etruscan, Greek, and indigenous Italian sources, and then deals with

the architecture, sculpture and painting from the early republic to the end of the empire in Italy, and to some extent in the provinces. 3 s.h. (W) MARKMAN

133. MEDIAEVAL ARCHITECTURE.—A survey of Christian architecture in the Near East, the Balkans, Russia, and western Europe from the beginnings of the mediaeval style in the late classical period to its disintegration in the fifteenth century. 3 s.h. (E) Miss SUNDERLAND

134. MEDIAEVAL PAINTING AND SCULPTURE.—A study of painting, including mosaics, manuscripts, stained glass, and sculpture, in western Europe from the late classical period through the fourteenth century. 3 s.h. (E) Miss SUNDERLAND

136. NORTHERN RENAISSANCE ART.—A study of book illumination, panel painting, graphic arts, and sculpture as expressions of literary, religious, and philosophical ideas of the fifteenth and sixteenth centuries in the Low Countries, Germany, and France. Some emphasis will be placed on individual artists such as the Van Eycks, Van der Weyden, Bouts, Van der Goes, Bosch, Bruegel, Grünewald, and Dürer. 3 s.h. (E) MUELLER

137. ITALIAN RENAISSANCE PAINTING AND SCULPTURE.—This course traces the evolution of painting and sculpture in Italy from the beginning of the fifteenth century through the middle of the sixteenth. Special emphasis is placed on developments in Florence, Venice, and Rome. 3 s.h. (E) Miss JENKINS

140. SEVENTEENTH CENTURY PAINTING AND SCULPTURE IN EUROPE.—This course traces the evolution of the Baroque style in European painting and sculpture with some attention being given to related manifestations in the late sixteenth and early eighteenth centuries. Particular emphasis is laid on developments in Flanders, France, Holland, and Spain. 3 s.h. (E) Miss JENKINS

141. AMERICAN ART.—A survey of architecture, sculpture, and painting in America from the time of the first settlers to the present day, including a consideration of the contributions of the English, Dutch, French, and Spanish to the artistic heritage of the United States. 3 s.h. (E) PATRICK

143. THE HISTORY OF PRINTS AND DRAWINGS.—An historical and critical study of drawings and prints from the fifteenth century to the present with reference to functions, values, and relationships to other forms such as painting, sculpture, and the book. 3 s.h. (E) MUELLER

144. RENAISSANCE AND BAROQUE ARCHITECTURE.—A study of the development of Renaissance architecture in Italy from its beginnings in the fifteenth century in the works of Brunelleschi to its flowering in the seventeenth century Baroque works of Bernini and Borromini, along with a consideration of the spread of Italian Renaissance forms to north Europe in the sixteenth century and its development into a Baroque style in the seventeenth century. 3 s.h. (E) Miss SUNDERLAND

145-146. THE RISE OF CONTEMPORARY ARCHITECTURE.—A study of the sources and evolution of the architecture of today, from the eighteenth-century conflict between Romantic Historicism and Industrialism to the work of Gropius, LeCorbusier, Wright, and their successors. 6 s.h. (E) Miss HALL

Seniors graduating at midyears may receive credit for 145, which is otherwise prerequisite to 146.

147. PAINTING AND SCULPTURE IN THE EIGHTEENTH AND NINETEENTH CENTURIES.—An investigation of the development of painting from the final stages of the Baroque in the eighteenth century to the period of the impressionist movement in the last decades of the nineteenth century. 3 s.h. (E) HANNEGAN, Miss SUNDERLAND

148. MODERN PAINTING AND SCULPTURE.—The history of European painting and sculpture from 1863 to the present day. The course investigates the rise of the anti-academic movements of Impressionism and Post-Impressionism in the latter half of the nineteenth century; their outgrowth in Cubism, Expressionism, and Surrealism; and the various abstract styles of the twentieth century. Particular emphasis is placed on such artists as Manet, Renoir, Cezanne, van Gogh, Gauguin, Seurat, Matisse, Picasso, Braque, and Klee. 3 s.h. (E) PATRICK

149. PRE-COLUMBIAN ART AND ARCHAEOLOGY.—A study of the architecture, sculpture, pottery, and other arts of the indigenous civilizations in Mexico, Central America, and the Andean region of South America before the Spanish conquest. 3 s.h. (W) MARKMAN

150. LATIN AMERICAN ART.—A study of the architecture, painting, and sculpture of Latin America from colonial times to the present. Particular emphasis will be placed on architecture of the colonial period in Mexico, Peru, and Brazil. The recent developments in mural painting in Mexico and architecture in both Mexico and Brazil will also be stressed. 3 s.h. (W) MARKMAN

191, 192. INDEPENDENT STUDY.—Open to highly qualified students by permission of the department. (See page 38.)

FOR SENIORS AND GRADUATES

217. AEGEAN ART.—A study of the problems of Aegean art as the forerunner of Greek art and in relation to the contemporary civilization of the eastern Mediterranean world. 3 s.h. (W) MARKMAN

218. EARLY GREEK ART.—A study of the problems of the origin and development of Greek art in the Geometric period to the end of the Archaic. 3 sh. (W) MARKMAN

233. EARLY MEDIAEVAL ARCHITECTURE.—The development of religious architecture from the time of Constantine to the end of the First Romanesque style in the third quarter of the eleventh century. 3 s.h. (E) MISS SUNDERLAND

234. ROMANESQUE SCULPTURE.—The development of sculpture in western Europe from the early Christian period through the culmination of Romanesque art in the west portal of Chartres Cathedral. 3 s.h. (E) MISS SUNDERLAND

239. ARCHITECTURE OF BRITAIN.—After a summary of recent archaeological activity in the British Isles, and a survey of Mediaeval building, the course deals principally with changing architectural problems and their solutions from the advent of the Renaissance onward. Attention is given to the interests of students majoring in history or literature. 3 s.h. (E) MISS HALL

240. ARCHITECTURE OF NORTH AMERICA.—A study illustrating the transplantation of European architectural customs since the sixteenth century; the time lag in transit and acceptance of later European developments; the gradual assumption of confident independence in design; and the emergence of international leaders in the United States. 3 s.h. (E) MISS HALL

292. RESEARCH PROBLEMS IN THE COLLECTIONS OF THE NORTH CAROLINA MUSEUM OF ART.—A specialized study of selected art works in the collections of the North Carolina Museum of Art. Students will meet once every week in the museum in Raleigh. In completion of the course each student will submit a report on his particular research project. 3 s.h. (E) BIER

DESIGN

Students other than art majors may receive not more than eight semester hours credit for work in studio courses. For any number of semester hours of credit in studio courses an equal number of hours must be taken in History and Criticism. The Introductory courses 1L-2L or 51L-52L are prerequisite for all courses in Design.

1L-2L. DESIGN LABORATORY.—This course aims to develop the student's visual faculty through practice with design elements and experience with media. Freshmen intending to elect further courses in Art are advised to carry this course concurrently with Art 1-2. Open only to freshmen enrolled in Art 1-2; others, see Art 51L-52L. 2 s.h. (E) BRODERSON

51L-52L. DESIGN LABORATORY.—The aims, content, and method of this course are similar to those of Art 1L-2L. Upperclassmen intending to elect further courses in Art are advised to carry this course concurrently with Art 51-52. Open only to upperclassmen enrolled in Art 51-52, and to those who have completed Art 1-2 or 51-52 without electing Design Laboratory. A senior in his last semester may receive credit for one semester. 2 s.h. (E) BRODERSON

53-54. BEGINNING STUDIO.—A studio course offering experiment and practice with formal elements of composition in various media. Particular emphasis will be given to drawing; watercolor, collage, and three-dimensional media will be secondarily considered. 4 s.h. (E) BRODERSON, PRATT

55, 56. PAINTING.—A studio course designed to give experience in painting media with individual and group criticism, and discussion of important historic or contemporary ideas in painting as related to student work. Prerequisite: Art 53-54 or consent of the instructor. 4 s.h. (E) BRODERSON, PRATT

157, 158. ADVANCED PAINTING.—Emphasis is given to the techniques of various painting and design media. Prerequisite: 55, 56. 4 s.h. (E) BRODERSON, PRATT

159, 160. PRINTMAKING.—This course presupposes a knowledge of design and skill in drawing. Practice in wood engraving; block printing; and in copperplate engraving, etching, acquatint, and drypoint. Reference will be made to prints in relation to the design of the book, and historic examples of the art of the print will be analyzed in the study of these techniques. Prerequisite: 53-54. 4 s.h. (E) MUELLER

DEPARTMENTAL MAJOR IN ART

Prerequisite: Introduction to Art History (1-2 or 51-52); or, with the approval of the Director of Undergraduate Studies, equivalent hours in 100 level courses which form a background for the History of Art.

Major Requirements: The student will select in consultation with the departmental adviser a sequence of courses emphasizing either the History of Art or Design.

a. History of Art: 24 semester hours from 100 and 200 level courses distributed over the entire field of Art History, and a concentration of courses in at least two areas.

b. Design: 22 semester hours, of which 16 must be in Design and 6 from courses in the History of Art and Theory.

Related Work: 18 semester hours elected from courses in aesthetics, anthropology, English, German, Greek, Latin and Roman Studies, history, history of music, history of religion, linguistics, philosophy, psychology, Romance Languages, and sociology.

The Department offers work leading to graduation with distinction. See the Section on honors in this *Bulletin*.

BIOLOGY

See courses listed under Botany and Zoology.

BOTANY

ASSOCIATE PROFESSOR JOHNSON, CHAIRMAN; ASSOCIATE PROFESSOR WILBUR, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSORS STONE AND WHITE, SUPERVISORS OF FRESHMAN INSTRUCTION; PROFESSORS ANDERSON, BILLINGS, HARRAR, KRAMER, NAYLOR, OOSTING, AND PERRY; ASSOCIATE PROFESSORS CULBERSON AND PHILPOTT

1. BIOLOGY OF PLANTS.—An introduction to the structure and life-processes of seed plants and the environmental factors influencing their distribution. Lectures, laboratory, discussions, and field trips. 4 s.h. (W) STAFF

2. BIOLOGY OF PLANTS.—An introduction to reproduction, heredity, and identification with emphasis on flowering plants; and an introduction to the microflora important in biological communities. Prerequisite: Botany 1. 4 s.h. (W) STAFF

52. PLANT IDENTIFICATION.—Practice in the identification of local plants and a study of the principles underlying plant classification. Laboratory, lectures, and field trips. Prerequisite: one year of botany. 4 s.h. (W) WILBUR

55. PLANT ANATOMY.—A comparative study of basic cell types, tissues and organs of vascular plants. Correlation of anatomical information with pertinent

literature, and application of anatomy to problems in systematics and evolution, and the interrelationship between structure and function. Prerequisite: one year of botany or permission of instructor. 4 s.h. WHITE

101. PRINCIPLES OF HEREDITY.—The basic principles of heredity and their significance. Lectures, three hours; laboratory, two hours; conference, one hour. Laboratory work includes experimental breeding of the fruit fly. May be taken as a lecture course without laboratory. Prerequisite: one (high-school or college) course in biology, botany, or zoology. High-school algebra or one year of college mathematics recommended. 3 (without laboratory) or 4 s.h. (w) PERRY

103. GENERAL BACTERIOLOGY.—A study of the morphology and fundamental physiological processes of bacteria: their relationship to sanitation, public health, soil fertility, and food preservation. Prerequisite: one year of botany or zoology, or equivalent. 4 s.h. (w) HUMM

105. PLANT MORPHOLOGY.—Vegetative organization and reproductive cycles of major plant group representatives. Main theories of evolutionary origin and phylogenetic interrelationships. Prerequisite: One year of botany. 4 s.h. CULBERSON

151. INTRODUCTORY PLANT PHYSIOLOGY.—The principal physiological processes of plants, including water relations, synthesis and use of foods, and growth phenomena. Prerequisite: Botany 1, 2 or equivalent; one year of chemistry recommended. 4 s.h. (w) KRAMER

156. PLANT ECOLOGY.—Principles of the relationships between plants and their environment. The structure and processes of typical ecosystems. Laboratory, lectures, and field trips. Prerequisites: Botany 1, 2 and 52, or equivalent. 4 s.h. (w) BILLINGS

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year by permission of the Department. See page 38. 6 s.h.

202. GENETICS.—The principles of heredity, their cytological basis, and their bearing on other fields of biology. Laboratory work involves experimental breeding of the fruit fly and interpretation of data from the breeding of plants. Offered in alternate years. Prerequisites: one year of botany, zoology, or equivalent, and one year of college mathematics. 4 s.h. (w) PERRY

203. PLANT CYTOLOGY.—A study of the structure and organization of plant cells in relation to growth, reproduction and especially heredity. Offered jointly with zoology. Prerequisite: one year of botany. 4 s.h. (w) ANDERSON

209. LICHENOLOGY.—Morphology, systematics, and biological and ecological implications of the lichens. Collection and identification of specimens and the use of lichen chemistry in taxonomy. Prerequisite: Two semesters of botany. 3 s.h. (w) CULBERSON

210. BRYOLOGY.—Morphological, systematic and ecological characteristics of mosses and liverworts. 3 s.h. ANDERSON

212. PHYCOLOGY.—Morphological and ecological characteristics of common freshwater and marine algae and principles of their classification. Collection, identification and preparation of permanent specimens. 3 s.h. HUMM

218. COMPARATIVE MORPHOLOGY OF VASCULAR PLANTS.—Fundamental anatomical and morphological problems and theories in relation to vascular plant evolution; emphasis on comparative vegetative and reproductive characters indicating evolutionary trends. Basic techniques in preparing materials, analyzing results and correlating with current literature. 4 s.h. WHITE

221. MYCOLOGY.—Field and laboratory study of vegetative and reproductive structures of the fungi and slime molds. Methods of collection, isolation, propagation, and identification of the major orders as represented in the local flora. Prerequisite: One year of biological science. 4 s.h. (w) JOHNSON

225, 226. SPECIAL PROBLEMS.—Students with adequate training may do special work in the following fields:

1. MYCOLOGY AND PLANT PATHOLOGY. JOHNSON
2. CYTOLOGY. ANDERSON
3. ECOLOGY. OOSTING AND BILLINGS
4. GENETICS. PERRY
5. MORPHOLOGY AND ANATOMY OF VASCULAR PLANTS. PHILPOTT AND WHITE
6. BRYOLOGY. ANDERSON
7. PHYSIOLOGY. KRAMER AND NAYLOR
8. TAXONOMY OF VASCULAR PLANTS. STONE AND WILBUR
9. BACTERIOLOGY. HUMM
10. LICHENOLOGY. CULBERSON
11. PHYCOLOGY. HUMM

240. PLANT EVOLUTION.—Microevolutionary change and factors influencing its rate and direction, with primary emphasis on examples from the plant world. 3 s.h. (w) STONE

252. PLANT METABOLISM.—The physiochemical processes and conditions underlying the physiological processes of plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 s.h. (w) NAYLOR

254. PLANT WATER RELATIONS.—A study of factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Assigned readings, reports, and lectures. Prerequisite: Botany 151 or equivalent. 3 s.h. (w) KRAMER

255. PLANT SYSTEMATICS.—A study of the historical background of plant taxonomy, modern concepts and systems of classification, nomenclatural problems, and the taxonomy of specialized groups. Prerequisite: two years of botany, including Botany 52 or equivalent. 4 s.h. (w) WILBUR

256. COMMUNITY ANALYSIS AND CLASSIFICATION.—The development of concepts and methods in synecology and their present application to the study of plant communities. Prerequisite: Botany 156 or equivalent. 3 s.h. (w) OOSTING

257. PRINCIPLES OF PLANT DISTRIBUTION.—Interpretation of floristic and ecological plant geography of world vegetation. Prerequisite: Botany 156 or equivalent. 3 s.h. (w) BILLINGS

258. PHYSIOLOGY OF GROWTH AND DEVELOPMENT.—Consideration of the internal factors and processes leading to the production of new protoplasm and its differentiation at the cellular, tissue, and organ level in plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 s.h. (w) NAYLOR

259. THE ENVIRONMENT.—Environmental principles and methods of obtaining and evaluating climatological data for ecological purposes with special attention to instrumentation and microclimate. Prerequisite: Botany 156 or equivalent. 3 s.h. (w) BILLINGS

MARINE LABORATORY.—Botany 211, *Marine Algae,* and 207, *Marine Mycology,* are given alternate years at the Duke University Marine Laboratory, Beaufort, N. C.; Botany 220, *Coastal Field Botany,* is offered biennially. Consult the *Bulletin of the Marine Laboratory.*

253. DENDROLOGY.—Nomenclature, classification, and identification of woody plants with special reference to species indigenous to southeastern United States and other important forest regions of temperate North America. Laboratory and field work. Prerequisite: one year of botany. 3 s.h. (w) HARRAR

DEPARTMENTAL MAJOR

Prerequisites: Botany 1 and 2.

Major Requirements: A minimum of 24 hours (A.B. and B.S.) of work beyond Botany 1 and 2, including at least four of the following courses: Botany 52 (Systematics), 55 (Anatomy), 105 (Morphology), 101 (Principles of Heredity), 151 (Physiology) and 156 (Ecology). The remaining hours may be selected from these and any other courses in the Department for which the student is eligible, subject to approval of the Director of Undergraduate Studies.

Related Work: Courses in at least two natural science departments sufficient to total, with major work, 42 s.h. (A.B.) or 48 s.h. (B.S.)

CHEMISTRY

PROFESSOR SAYLOR, CHAIRMAN; PROFESSOR WILDER, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSOR BONK, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS BRADSHER, BROWN, GROSS, HAUSER, HILL, HOBBS, KRIGBAUM, AND STROBEL; ASSOCIATE PROFESSORS POIRER, QUIN, AND SMITH; ASSISTANT PROFESSORS JEFFS, JONES, TOREN AND WELLS; AND ASSISTANTS

1, 2. GENERAL INORGANIC CHEMISTRY.—Lectures and recitations on the elementary principles of chemistry and on the structure, properties, preparation and uses of the elements and their compounds. The laboratory work includes qualitative analysis of some of the more common metals. One lecture, two recitations, and three laboratory hours, throughout the year. Chemistry 1 is a prerequisite for Chemistry 2. Prerequisite: Qualification for Math 21. 8 s.h. (E & W)
BONK, STAFF AND ASSISTANTS

41. ADVANCED GENERAL CHEMISTRY.—More theoretical than Chemistry 1, emphasizes atomic and molecular structure, kinetic molecular theory, chemical equilibrium, and elementary thermodynamics. Credit is not awarded for both 1 and 41. Prerequisites: Mathematics 21, may be taken concurrently, and permission of the instructor. 4 s.h. (W) STROBEL AND WILDER

42. INTRODUCTION TO CHEMICAL ANALYSIS.—An intensive study of solutions of electrolytes with special reference to chemical equilibrium. Laboratory experiments illustrate the principles of chemical equilibrium and the techniques of quantitative and instrumental analysis. Credit is not awarded for both Chemistry 2 and 42 nor for both 42 and 61. One lecture, one recitation and six laboratory hours. Prerequisites: Permission of the Director of Undergraduate Studies, Chemistry 1, and Mathematics 21. 4 s.h. (W) STROBEL AND WILDER

61. FUNDAMENTALS OF ANALYTICAL CHEMISTRY.—A study of the reactions of electrolytes in solution and of chemical equilibrium illustrated by laboratory experiments involving the techniques of gravimetric, volumetric, chromatographic, and instrumental analysis. One lecture, one recitation, and six laboratory hours. Prerequisites: Chemistry 1, 2 and Mathematics 21. 4 s.h. (W)
WILDER, JONES, POIRER, TOREN AND ASSISTANTS

70. QUANTITATIVE ANALYSIS.—A study of the theory and techniques of inorganic gravimetric and volumetric analysis. One lecture, one recitation, and six laboratory hours. Not open to B.S. Chemistry majors. Prerequisite: Chemistry 42 or 61. 4 s.h. (W) TOREN, WELLS AND ASSISTANTS

132. QUANTITATIVE AND INSTRUMENTAL ANALYSIS.—Practice in advanced quantitative analysis and in the use of physical instruments in analysis with special attention to optical devices, together with a discussion of theoretical aspects. Two recitations and six laboratory hours. Prerequisites: Chemistry 161, 162, the latter half of which may be taken concurrently. 4 s.h. (W) TOREN

151, 152. ORGANIC CHEMISTRY.—An introduction to the study of the compounds of carbon in which the chemistry of both aliphatic and aromatic compounds is considered. Laboratory experiments are selected to illustrate the more important reactions and preparations of organic compounds. Two lectures, one recitation, and three laboratory hours. Prerequisite: Chemistry 42 or 61. Chemistry 151 is prerequisite for 152. 8 s.h. (W) BRADSHER, MISS BROWN, JEFFS, QUIN, WILDER AND ASSISTANTS

161, 162. PHYSICAL CHEMISTRY.—Fundamentals of general theoretical chemistry illustrated by selected laboratory experiments. Three recitations and three laboratory hours. Prerequisites: Chemistry 152, Physics 41-42, and Mathematics 63. 8 s.h. (W) HOBBS AND SMITH

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students by permission of the department. (See page 38.)

206. ELEMENTS OF THEORETICAL CHEMISTRY.—A one semester course in the principles of physical chemistry. Credit is not given for both 206 and 161-

162. Three recitation and three laboratory hours. Prerequisites: Chemistry 70, 152, Physics 41-42, and Mathematics 22. 4 s.h. (w) SAYLOR AND JONES

215. ADVANCED INORGANIC CHEMISTRY.—A study of modern theories of valence and molecular structure and of inorganic compounds, particularly the less common types. Prerequisites: Chemistry 162 or 206. 3 s.h. (w) HILL

216. NUCLEAR CHEMISTRY.—Elementary theory of nuclear reactions, properties of isotopes, and tracer techniques. Two recitations and three laboratory hours. Prerequisites: Chemistry 70 or 132, 152, and Physics 41-42. 3 s.h. (w) HILL AND TOREN

234. CHEMICAL INSTRUMENTATION.—Discussion of physiochemical principles as applied to instrumental methods of analysis, illustrated by laboratory experiments with emphasis on methods involving electrical techniques. One lecture and three laboratory hours. Prerequisite: Chemistry 161, which may be taken concurrently. 2 s.h. (w) STROBEL

251. QUALITATIVE ORGANIC ANALYSIS.—Systematic identification of organic compounds based upon a study of physical and chemical properties. Infrared and ultraviolet absorption spectra are used in elucidation of structure. One lecture and six laboratory hours per week. Prerequisite: Chemistry 152. 3 s.h. (w) QUIN

252. ADVANCED ORGANIC PREPARATIONS.—A laboratory course designed to supplement the student's knowledge of fundamental organic processes by a selected group of laboratory exercises accompanied by discussions of techniques and theories pertinent to the experiments. Five hours laboratory and lecture with lectures in alternate weeks. Prerequisite: Chemistry 152. 2 s.h. (w) MISS BROWN

253. INTERMEDIATE ORGANIC CHEMISTRY.—An advanced study of the reactions of organic compounds and the theories of organic chemistry. Prerequisite: Chemistry 152 and permission of the Director of Undergraduate Studies. 3 s.h. (w) BRADSHER, QUIN, AND WILDER

265. INORGANIC CHEMISTRY.—An advanced study of the bonding, structures, and reactions of inorganic compounds based on modern physical chemical concepts. Three lectures. Prerequisite: Chemistry 162 or the permission of the Director of Undergraduate Studies. 3 s.h. (w) WELLS

271. INTRODUCTION TO RESEARCH.—Lectures on the use of chemical literature, research methods, recording and publication of results, and other topics. One lecture. 1 s.h. (w) MISS BROWN

275-276. RESEARCH.—A course designed to give instruction in methods used in the investigation of original problems. It is open to seniors by permission of the Director of Undergraduate Studies. 1 to 3 s.h. (w) STAFF

DEPARTMENTAL MAJOR

A. For the degree of A.B.

Prerequisites: Chemistry 1, 2, Mathematics 21, 22.

Major Requirements: 22 s.h., including Chemistry 61, 70, 151, 152, and an additional 6 to 8 s.h., which may be satisfied by 161-162 or 206 together with 2 or 3 s.h. selected from courses 216, 234, 251, and 252.

Related Work: 20 s.h., including Physics 41-42 with the remainder usually in botany, geology, mathematics, physics or zoology.

B. For the degree of B.S.

Prerequisites: Chemistry 1 or 41 and 2 or 42, Mathematics 21, 22, 63.

Major Requirements: Chemistry 61, 132, 151, 152, 161, 162, 251, 265, 271, and 216 or 234 or 252.

Related Work: 18 s.h., including Physics, 11 s.h. and Mathematics 64 or 131 or 221.

The language requirements must be satisfied by German 64 and either French 2 or Russian 2.

The department offers work leading to graduation with distinction. Consult the section on Honors and Prizes in this *Bulletin*.

CHINESE

(Elementary Chinese [101-102] is offered by the University of North Carolina, Chapel Hill. Three semester hours of credit each semester; five hours each week: three of grammar, two of oral practice. Prerequisite: junior standing.)

CLASSICAL STUDIES

PROFESSOR ROGERS, CHAIRMAN, DIRECTOR OF UNDERGRADUATE STUDIES IN LATIN; PROFESSOR TRUESDALE, DIRECTOR OF UNDERGRADUATE STUDIES IN GREEK; PROFESSORS ULLMAN AND WILLIS, ASSISTANT PROFESSORS SETTLE, STANLEY AND WOMBLE; INSTRUCTOR WOOLEY

GREEK

Courses 15, 121, 122, 131, 141, 142, 151 are entirely in English and require no knowledge of the Greek language. The purpose in offering them is to give a wider circle of students some conception of the debt which modern civilization owes to the Greeks.

1-2. COURSE FOR BEGINNERS.—Open to all students. 6 s.h. (w) WOOLEY

15. MYTHOLOGY.—A study of Greek mythology and the use made of it in art and English literature. No knowledge of the Greek language is required. Open to freshmen as an elective in either semester. 3 s.h. (E & W)
TRUESDALE AND WOOLEY

63-64. INTERMEDIATE GREEK.—Intensive review of fundamentals with emphasis on development of comprehensive reading ability. Selections from Herodotus, Xenophon, and Lysias. Open to students who have completed courses 1-2. 6 s.h. (w) STANLEY

105-106. HOMER.—*Iliad*, Books I-III. PLATO.—*Apology* and *Crito*. Open to students who have completed courses 1-2 and 63-64 or their equivalent. 6 s.h. (w)
TRUESDALE

107-108. EURIPIDES.—*Medea*. SOPHOCLES.—*Oedipus Tyrannus*. ARISTOPHANES.—*Clouds*. Open to students who have completed the required preliminary work. 6 s.h. (w) TRUESDALE

117-118. GREEK PROSE COMPOSITION.—The character of this course is determined by the needs of the students enrolled. 3 s.h. (w) TRUESDALE

121, 122. GREEK LITERATURE IN ENGLISH TRANSLATION.—The purpose of this course is to give a general survey of the life and civilization of the Greeks, especially to those who have never studied the language but wish to become acquainted with some of the choicest portions of the literature by the use of translations. It is, however, open as an elective to all juniors and seniors, whether or not they know Greek. First, the *Iliad* and the *Odyssey* are read in translation and illustrated with slides of the excavations and discoveries at Troy and other cities of the Aegean age; then, many of the extant plays of the three great tragic poets are studies in English translation. 6 s.h. (E & W)
TRUESDALE AND STANLEY

Students may elect course 122, whether or not they have taken course 121.

131. HISTORY OF GREECE.—The history of the Greek world from the Late Bronze Age to the Macedonian conquest. Open to seniors, juniors, and (by arrangement) sophomores. No knowledge of Greek is required. 3 s.h. (E) WOOLEY

141, 142. GREEK ART.—Open to seniors, juniors, and sophomores. A comprehensive survey of the development of Greek architecture and Greek sculpture in all periods. Course 141 is opened by a preliminary account of Egyptian, Mesopotamian, and Aegean artistic backgrounds. Course 142 is devoted chiefly to Greek art of the greatest period with the main emphasis on sculpture, and may be elected independently of course 141. All lectures are fully illustrated by slides. No knowledge of Greek is required. 6 s.h. (E) STANLEY

151. GREEK ARCHAEOLOGY.—A general treatment of the subject, with emphasis upon the value of archaeological discovery as evidence of the artistic development

of the Greek people. The course includes a survey of the various archaeological sites. Open to seniors, juniors, and (by arrangement) sophomores. 3 s.h. (E) STAFF

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students, in the junior year, by permission of the department. See page 38.

LATIN

Students who wish by study in English to make acquaintance with Roman antiquity from either a literary or an historical approach are afforded that opportunity through the courses in translated Latin Literature (111, 112), and Roman History (131, 132).

1-2. COURSE FOR BEGINNERS.—Forms, vocabulary, pronunciation, and syntax, with reading of easy Latin prose. The effort is made to promote rapid development of the ability to read Latin with satisfaction. 6 s.h. (E) SETTLE

63. CICERO'S ORATIONS.—Selected orations of Cicero are read with attention to prose style. Prerequisite: Latin 1-2, or equivalent. 3 s.h. (E) SETTLE AND WOOLEY

91. LATIN PROSE.—Selections from prose authors or Cicero's *De Senectute* and *De Amicitia,* or selected books of Livy's history, with special emphasis on developing competence in reading Latin. 3 s.h. (E) STANLEY AND WOMBLE

92. LATIN POETRY.—Selections from the greatest Latin poets, especially Horace's *Odes.* 3 s.h. (E) STANLEY AND WOMBLE

97. SIGHT READING IN CLASSICAL LATIN.—One period of an hour per week devoted to practice in the reading of Latin on the classical period; designed to train students to read with facility. 1 s.h. (E) WILLIS

98. SIGHT READING IN MEDIAEVAL LATIN.—One period of an hour per week devoted to reading interesting mediaeval prose and poetry. Prerequisite: at least one of the following courses: Latin 63, 64, 91, 92, and 97, or an equivalent. 1 s.h. (E) WILLIS

101. TACITUS.—Interesting and historically important selections from the *Annals* or the *Histories* of Tacitus are read, with attention to the literary style and the value of the historical narrative. 3 s.h. (E) SETTLE

102. JUVENAL.—Juvenal's literary satire forms the basis of the course. 3 s.h. (E) SETTLE

103. CICERO.—Selections from one of the major philosophical works, with attention to Cicero's philosophical thought and literary style. 3 s.h. (E) WILLIS

104. LUCRETIUS.—A study of Lucretius as a philosophical thinker and as a poetic artist. 3 s.h. (E) WILLIS

105-106. LATIN PROSE COMPOSITION.—Recommended to students who are pursuing courses 63, 64, 91, 92, and 97, and may at the discretion of the instructor be required of such students. 4 s.h. (E)

111, 112. ROMAN LITERATURE IN ENGLISH TRANSLATION.—Selective readings in Latin literature in English translation with emphasis on the drama, lyric poetry, and the varied contributions of Cicero to literature in the first term, and upon the epic, the satire, and the novel in the second semester. (No language credit.) 6 s.h. (E) SETTLE

131, 132. HISTORY OF ROME.—A survey of the history of the Roman State from its beginnings to the death of Justinian; its expansion; development of its constitution and public administration; social, legal, political and economic problems of perennial life and interest; the background and setting of Christianity's rise and growth. (This course carries no language credit. No knowledge of Latin is required for admission.) 6 s.h. (E) ROGERS

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the department. See page 38. 6 s.h.

205-206. MEDIAEVAL LATIN.—Selections from representative writers in prose

and poetry. Practice in dealing with microfilms of mediaeval Latin texts. 6 s.h. (W) ULLMAN

211-212. ROMAN ORATORY.—A reading course in the history and development of Roman oratory, based for the most part on Cicero's *Brutus* and the *Dialogus* of Tacitus. 6 s.h. (E) ROGERS

DEPARTMENTAL MAJOR IN GREEK

Prerequisite: Greek 1-2.

Major Requirements: 24 semester hours, including the following courses: Greek 63-64, 105-106, 107-108, 117-118, and 131.

Related Work: Eighteen semester hours, selected usually in Latin, linguistics, philosophy, art, and English.

DEPARTMENTAL MAJOR IN LATIN

Prerequisite: Latin 1-2, 63-64, or equivalent.

Major Requirements: 24 semester hours which must include courses 91, 92, 101, 102, 103, 104, and 6 semester hours in courses at the 200-level.

Recommended Courses: Latin 105-106, Composition, and 131, 132, Roman History.

Related Work: Eighteen hours of related work, elected usually in Greek, linguistics, philosophy, art, Romance Languages, and English. Majors who contemplate graduate work are reminded of the necessity of Greek, German, and French for such study.

Graduates of Duke University may attend the American School of Classical Studies at Athens, Greece, without charge for tuition and are eligible to compete for the fellowships that are offered annually by the School. These consist of two fellowships in Greek archaeology and one in the language, literature, and history of ancient Greece, each with a stipend of $2,000. They are awarded mainly on the basis of examinations held in the beginning of February of each year. A somewhat similar connection exists with the American Academy in Rome.

COLLOQUIUM 101, 102.—See *Honors-Masters Program* on pages 37 and 94 of this *Bulletin.*

COMPARATIVE LITERATURE

The courses in Comparative Literature may be taken as electives by advanced students; certain courses serve as related work in several departments (see the entries for related work under the separate departments).

No major work is offered in Comparative Literature. Students interested in the study of the interrelationships of literature as a part of their undergraduate program, or as preparation for graduate work, should consult Mr. Salinger.

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to qualified students in the junior year, by permission of the department. See p. 36. 6 s.h. SALINGER

201, 202. ROMANTICISM.—Studies in the origin, rise and development of the Romantic Movement in the chief literatures of the Western World. The approach is comparative; the principal emphasis will be on England, France, and Germany, with some reference to other countries. Selected subjects will be covered in occasional lectures by speakers from various departments of the University. 6 s.h. SALINGER

203, 204. REALISM AND SYMBOLISM.—Comparative studies in the literatures of England, France, Germany, Russia, the Scandinavian countries, Spain and Italy, tracing the decline of romantic individualism and the reappraisal of man's significance against the social background. Selected subjects will be covered in occasional lectures by speakers from various departments of the University. 6 s.h. SALINGER

205. FOUNDATIONS OF TWENTIETH-CENTURY EUROPEAN LITERATURE.—The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Lagerkvist, Anouilh, Camus) evolving toward a mythology of man. 3 s.h. SALINGER

For a description of the following courses see the departmental listing.

READINGS IN EUROPEAN LITERATURE (English 153, 154). KRUEGER
READINGS IN SCANDINAVIAN LITERATURE (English 159) ANDERSON
MODERN EUROPEAN DRAMA (English 155) REARDON
RELIGIOUS VALUES IN CLASSICAL AND EUROPEAN LITERATURE (Religion 187). WHITE

ECONOMICS AND BUSINESS ADMINISTRATION

PROFESSOR SMITH, CHAIRMAN; PROFESSOR JOERG, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BLACK, DE VYVER, DICKENS, FERGUSON, HANNA, HOOVER, LANDON, MCGEE, SAVILLE, AND SPENGLER; ASSOCIATE PROFESSORS BLACKBURN, DAVIES, GERHARD, GOODWIN, KELLER, KREPS, AND YOHE; ASSISTANT PROFESSORS DE ALESSI, ETTIN, KEANE, NAYLOR, PETHIA, AND WALLACE; VISITING PROFESSORS INGRAM, C. KREPS; VISITING ASSOCIATE PROFESSOR ROBERTS; VISITING ASSISTANT PROFESSORS (PART-TIME) GALIFIANAKIS AND HAHN; MESSRS. BRUCKER, RUTMAN, SAYLOR, AND WARREN

The courses offered by the Department are listed under three divisions, Economics, Accounting, and Business Administration.

In general, the Economics courses aim to develop in the student such critical and analytical skills as underlie the ability to understand economic problems and institutions, both in their contemporary and in their historical setting. While no particular vocational or professional goal is emphasized, these courses furnish the academic background necessary for many positions in industry, for work in the economic branches of government service, and for graduate study in economics and the social sciences.

Courses in Accounting and Business Administration, although more concerned with general principles than with specific applications, stress in greater measure than courses in Economics the knowledge and techniques useful to students definitely preparing for business careers. The student who majors in Accounting may elect courses in accountancy, business law, and related work, sufficient to qualify for admission to C.P.A. examinations.

Economics 1 or 51 and 2 or 52 are recommended to all students planning to elect further courses in Economics and Business Administration.

ECONOMICS

1. INTRODUCTION TO ECONOMIC PROBLEMS AND POLICIES.—The present-day American economy and the challenge from centrally planned economies; policies to deal with problems of depression, inflation, growth, and automation. 3 s.h. (E & W) (Open only to Freshmen.) STAFF

2. THE EVOLUTION OF ECONOMIC IDEAS.—A study of man's economic activities and his ideas about them, from the ancient world to the present day. Emphasis is given to the historical roots of important contemporary economic ideologies. 3 s.h. (E & W) (Open only to Freshmen.) STAFF

51. PRINCIPLES OF ECONOMICS.—Examination of the main features of the American economy, measurement of national income, and analysis of forces determining national output and income; fluctuation and growth of output, monetary and fiscal policies for stability and growth. 3 s.h. (E & W) STAFF

52. PRINCIPLES OF ECONOMICS.—Examination of forces determining prices and production of goods, distribution of income; problems of agriculture, labor, international trade, economic development, and government in relation to business. 3 s.h. (E & W) STAFF

103. TRANSPORTATION.—Essential features, problems, and competitive positions of rail, highway, air, and inland-water transportation, with most emphasis on rail transportation. Special attention is given to the economic significance of transportation, and to cost factors, rates and their economic effects and regulations. 3 s.h. (W) LANDON

132. THE ECONOMIC HISTORY OF THE UNITED STATES.—Development of economic institutions as the United States passed from a wilderness area to an industrial society. Special attention is given to measures of economic change and their application to models of economic growth and fluctuation. 3 s.h. (w)
SAVILLE

149. THE THEORY OF THE FIRM.—Cost and supply considerations in price theory, the demand for factors of production. The allocation of resources is examined in the context of competitive and monopolistic market structures. 3 s.h. (w)
DE ALESSI

150. ECONOMIC THOUGHT SINCE ADAM SMITH.—A course of readings in leading economic writers of the nineteenth and twentieth centuries. 3 s.h. (w)
GOODWIN

152. GLOBAL GEOGRAPHY.—The subject matter involves resources patterns and world affairs, geonomic problems, geocultural problems, and geographic factors affecting geopolitical questions. 3 s.h. (E)
LANDON

153. MONEY AND BANKING.—The lender's side of financial markets. The activities of commercial banks and other financial institutions in supplying loanable funds and the effects of these activities on the money supply and its rate of use, the impact of central bank and Treasury operations on financial markets, and the evolution of the present monetary system and its institutions. 3 s.h. (w)
YOHE, ETTIN

154. AGGREGATIVE ECONOMICS.—Concepts and measurement of national income and expenditures, employment, and price levels; the theoretical determination of these aggregates; and applications of macro-economic theory to business cycles and economic growth. 3 s.h. (w)
BLACKBURN, YOHE

155. LABOR PROBLEMS.—An examination of present-day labor problems followed by an intensive study of methods used by employers and workers in meeting those problems. 3 s.h. (w)
DE VYVER; MRS. KREPS

160. THE POLITICAL ECONOMY OF EUROPE: RECENT DEVELOPMENTS.—A study of changing economic relations between European countries and of the changing position of Europe in the world economy after World War II. Selected topics of an interdisciplinary nature will be discussed by visiting lecturers. (w)
GERHARD

161. EUROPEAN ECONOMIC PROBLEMS.—An application of the theory of international economics to the problems of international economic integration with emphasis on the European Common Market. 3 s.h. (w)
GERHARD

169. ECONOMICS OF CONSUMPTION.—Economic problems of the family. Factors determining choice; commercial and legal standards for consumer's goods; consumer credit and co-operation; income and standards of living. 3 s.h. (w)
MRS. KREPS

189. BUSINESS AND GOVERNMENT.—A survey of the public policies which most directly affect the operation of competition in the business world. The course considers the leading philosophies of public control and economic development, the validity of their presuppositions, and their influence on legislation, court decisions and administrative law. 3 s.h. (w)
MCGEE

201. SENIOR SEMINAR IN ECONOMICS.—Problems in theory and applied economics. Readings, reports, and discussion of selected topics. For majors in Economics, with consent of the Department. 3 s.h. (w)
STAFF

204. ADVANCED MONEY AND BANKING.—Monetary theory and its statistical and institutional implementation. Particular attention is given to the development of aggregative theories of prices, interest rates and production; the functioning of monetary policy within various theoretical frameworks; and appraisal of the recent use and the limitations of Federal Reserve policy. 3 s.h. (w)
YOHE

218. BUSINESS CYCLES.—The characteristics and measurement of cyclical fluctuations in output, employment, and prices; an historical survey of business cycle theories; modern macroeconomic theory and public policy as they relate to business cycles and associated problems of economic growth; techniques of forecasting cycles. 3 s.h. (w)
YOHE

219. ECONOMIC PROBLEMS OF UNDER-DEVELOPED AREAS.—Consideration and analysis of the economic and related problems of under-developed countries. Some attention will be given to national and international programs designed to accelerate the solution of these problems. 3 s.h. (w) SPENGLER

231. ECONOMIC HISTORY OF EUROPE.—The economic development of Europe from medieval times to the present, treating such topics as the guilds, mercantilism, money, banking, crises, the Industrial Revolution, the interrelationships of government and business, and the economic consequences of war. 3 s.h. (w) SMITH

233. STATE AND LOCAL FINANCE.—A study of expenditures, taxation, and financial administration in state and local governments with emphasis on current problems. Special attention will be given to research methods and materials and to the financial relations between state and local governments. Prerequisite: Economics 287 or consent of instructor. 3 s.h. (w) DAVIES

237, 238. STATISTICAL METHODS.—A study of statistical methods appropriate for dealing with problems in business and social science. In addition to developing more thoroughly the subject considered in *Business Statistics,* the following methods will be considered: simple, multiple, partial, and curvilinear correlation; curve fitting; probability; sampling distributions; and statistical inference. Prerequisite: Economics 138 or consent of the instructor. *Either semester* may be taken for credit. 6 s.h. (w) HANNA AND WALLACE

243. MATHEMATICAL ECONOMICS.—A systematic survey of mathematical economic theory. The principal topics are vector spaces and matrices, macrostatics, especially input-output systems, and microstatics, especially models of the firm employing game theory and activity analysis. 3 s.h. (w) FERGUSON

244. INTRODUCTION TO ECONOMETRICS.—Economic theory, mathematics, statistical inference, and electronic computers applied to analysis of economic phenomena. Objective is to give empirical content to economic theory. Matrix algebra used to develop topics in inference, linear regression, and systems of simultaneous equations. Use is made of the electronic computer. 3 s.h. (w) NAYLOR

257. DYNAMICS OF THE LABOR MOVEMENT.—A study of the forces which have shaped the growth of the labor movement. Special emphasis on the origin of modern trade unionism, relating its growth with western philosophic developments, and with the changing economic and social structure of society in Europe and America. 3 s.h. (w) GOODWIN

262. TRADE UNIONISM AND COLLECTIVE BARGAINING.—An intensive survey of the trade union as an economic institution is followed by a study of the principles and problems of union-management relationship as found in collective bargaining. 3 s.h. (w) DE VYVER

265. INTERNATIONAL TRADE AND FINANCE.—A study of fundamental principles of international economic relations. Subjects covered include the economic basis for international specialization and trade, and the economic gains from trade, the balance of international payments, problems of international finance, of international investments, and international monetary problems. 3 s.h. (w) GERHARD

268. COMPETITION AND MONOPOLY.—A detailed study of the varieties of imperfectly competitive markets, the economic and legal issues which they raise, and the policy solutions which have been attempted in the United States. 3 s.h. (w) MCGEE

286. LATIN AMERICAN ECONOMICS.—A survey of the problems of economic development in twenty countries. 3 s.h. (w) SMITH

287. PUBLIC FINANCE.—An analysis of the impact of governmental expenditures, revenues, and debt on the allocation of resources, the redistribution of income, and the stabilization of income. 3 s.h. (w) DAVIES

293. ECONOMIC SYSTEMS.—A study of alternative economic systems. An historical and analytical study of the basic elements of capitalism and of collectivist types of economic systems. Particular attention is given to an analysis of the

economic system of Soviet Russia. Prerequisite: permission of the department. 3 s.h. (w) HOOVER

294. ECONOMIC FUNCTIONS OF THE STATE.—A continuation of Economics 293. A consideration of the economic functions of society and of the contrasting roles of the state in the various economic systems in carrying on these functions. The Nazi system, the quasisocialized economics of Europe, as well as the modifications of old-style capitalism in the United States are analyzed. Prerequisite: Economics 293. 3 s.h. (w) HOOVER

ACCOUNTING

57. PRINCIPLES OF ACCOUNTING I.—Provides a basic knowledge of accounting and a consideration of financial statements. Attention is focused on the nature and purpose of accounting, the measurement and classification of economic data, and accounting reports as a tool of management and the investor. 3 s.h. STAFF

58. PRINCIPLES OF ACCOUNTING II.—The problems of accounting for the control of monetary assets and costs, the problems of capital stocks and the elementary problems of decision making. The relationship of the firm and national income accounts is examined. Prerequisite: Economics 57. 3 s.h. STAFF

147. ACCOUNTING FOR CONTROL.—This course traces the ways and means of executive control through statistics and industrial accounting. Emphasis is placed upon controlling business enterprises through cost accounting, financial reports, and other techniques. This course is not open to accounting majors. Prerequisite: Economics 57-58. 3 s.h. (w) BLACK AND JOERG

171. ACCOUNTING THEORY.—Basic concepts, principles, and postulates are examined and related to the objective of income determination and asset valuation. Financial statements as a source of economic data and investor information are the focal points of the course. Prerequisite: Economics 58. 3 s.h. (w) KELLER

172. CORPORATE ACCOUNTS.—Deals with the complex problem of capital structure and debt. Considers in detail the effect of fluctuation in the purchasing power of the dollar on business affairs. Examines critically the many faceted problem of measuring and appraising business performance. Studies the many aspects of business combinations and foreign operations. Prerequisite: Economics 171. 3 s.h. (w) KELLER

178. ACCOUNTING SYSTEMS.—A presentation of the design and use of basic accounting procedures as applied to specialized business needs. Field trips to selected business units will be arranged. Prerequisite: Economics 171, 172 and the permission of the department. 3 s.h. (w) DICKENS

180. GOVERNMENTAL ACCOUNTING.—Accounting principles and methods used in the control and administration of governmental units. Emphasis is placed upon state, county and municipal governments. Prerequisite: Completion of or registration for Economics 171, 172. 3 s.h. (w)

273, 274. AUDITING, THEORY AND PRACTICE.—A study of basic auditing objectives, standards, ethics, terminology, procedures and reports. Accounting principles and statement presentation are studied from the viewpoint of the auditor. The place and responsibility of both the internal auditor and the public auditor are studied. Prerequisite: Economics 171, 172 and permission of the department. 6 s.h. (w) DICKENS

275, 276. ADVANCED INDUSTRIAL ACCOUNTING AND MANAGEMENT.—A comprehensive examination of the rationale and techniques of control methods used in industry. Emphasis is laid on a critical evaluation of the practices followed by job-order, process, and standard costing as well as the economics of overhead costs. Prerequisites: Economics 171, 172 and permission of the department. 6 s.h. (w) BLACK

277. INCOME TAX ACCOUNTING.—Presentation of the principles of Federal Income Tax laws as related to individuals, partnerships, estates, trusts and corporations. Prerequisite: Completion of or registration for Economics 171, 172. 3 s.h. (w) KEANE

278. ADVANCED PROBLEMS IN INCOME TAXATION.—A critical appraisal

of selected topics in the law of income taxation as it relates to corporations, partnerships, estates, and trusts. 3 s.h. (w) KELLER

279. BUDGETING AND CONTROL.—A consideration of methods used in period and project budgeting; the use of accounting, statistical, and mathematical methods in cost control; the use of numerical data in making decisions among alternative courses of action. 3 s.h. (w)

295, 296. ADVANCED ACCOUNTING SEMINAR-THEORY AND PRACTICE.—Thorough practice in classroom to prepare candidates for the Certified Public Accountant examination. The object is to train students to apply accounting principles and to work in classroom under substantially the same conditions as in the examination rooms. Practical accounting problems, auditing analysis and theory of accounts. Prerequisite: Economics 171, 172 and permission of the department. 6 s.h. (w) BLACK

Those who do not wish credit may take Economics 295, 296 for $25.00 per semester.

BUSINESS ADMINISTRATION

109. ECONOMIC GEOGRAPHY OF LATIN AMERICA.—This course involves comprehensive study of the resources and people of Mexico, the West Indies, and Central and South America. Special emphasis is placed upon the possibilities and limitations of increases in trade between the United States and the leading Latin-American countries. 3 s.h. (E)

114. ECONOMIC GEOGRAPHY OF AFRICA.—A continental study of the natural environmental factors of Africa and the basic economic patterns of adjustments and adaptations on regional or national bases. Prerequisite: Economics 115 or 120. 3 s.h. (E) TUTHILL

115. FUNDAMENTALS OF GEOGRAPHY.—A study of geographic influences consisting of location, maps and their interpretation, climate, topography, soils, minerals, bodies of water, plants, animals, and the works of man. This course is required of all students in the Elementary School Teaching program, and is also recommended for those intending to specialize in foreign trade or the diplomatic service. 3 s.h. (E) LANDON

120. ECONOMIC GEOGRAPHY OF THE PACIFIC.—An analysis of the physical influences, natural resources and economic activities of the Orient. 3 s.h. (E) TUTHILL

138. BUSINESS STATISTICS.—A survey of the principal statistical methods and their application to economics and business administration. The course deals with collection of statistical data, construction of statistical tables and charts, and a brief study of the fundamental statistical concepts and techniques. Offered both semesters. 3 s.h. (w) HANNA AND WALLACE

Open to juniors and to sophomores in the second semester. Not open to seniors except with permission of the Director of Undergraduate Studies.

143. CORPORATION FINANCE.—Principles and problems in the financial organization of corporations; the study of corporate securities, the management of capital, the distribution of earnings; industrial combinations; insolvency and reorganization. Prerequisite: Economics 57. Offered both semesters. 3 s.h. (w) JOERG AND ETTIN

144. INVESTMENTS.—A study of the investment policies of individuals and institutions; the securities markets; sources of investment information and data; the analysis and interpretation of financial statements. Prerequisites: Economics 143. 3 s.h. (w) JOERG AND ETTIN

146. MANAGERIAL ECONOMICS.—Economic analysis of the business firm, its goals, and the economic environment of business. Economic theory of the firm; various mathematical models of the firm; the internal decision making processes. No credit for those who have completed Economics 149. 3 s.h. (w) NAYLOR, WALLACE

181. BUSINESS LAW.—The fundamental principles of law as applied to routine business transactions. The topics presented are: contracts, agency, and negotiable instruments. 3 s.h. (w) GALIFIANAKIS

182. BUSINESS LAW.—A continuation of 181. The topics presented are: partnerships, corporations, sales, personal and real property, mortgages, suretyship, bankruptcy and trade regulation. 3 s.h. (w) Galifianakis

184. COMMERCIAL LAW FOR ACCOUNTANTS.—A review and summation of commercial law principles as they apply to accounting theory and practice. Emphasis will be placed upon the commercial law sections of the Certified Public Accountant examinations. Students are admitted to the course by permission of the instructor. *For seniors.* 3 s.h. (w) Black

185. BUSINESS ADMINISTRATIVE ORGANIZATION.—An analysis of human behavior in administrative organizations followed by a critical examination of alternative theories of administration and organization as relevant to the business firm. 3 s.h. (w) Pethia

188. PERSONNEL MANAGEMENT.—A study of the fundamental principles and problems of labor management and of collective bargaining under modern industrial conditions and under existing labor legislation. 3 s.h. (w) Pethia

190. QUANTITATIVE METHODS IN BUSINESS.—Introduction to operations research. Application of mathematics, statistics, and electronic computers to the solution of management problems. Topics include linear programming, inventory models, queuing theory, Markov processes, and computer simulation. 3 s.h. (w) Naylor

249. PRODUCT MARKETS.—Consumer behavior in price theory, the demand for final products. Relates the firm's demand to the type of market structure, and examines the firm's attempts to predict demand, its attempts to influence demand, and its price policies. 3 s.h. (w) Landon

291. BUSINESS POLICY.—An integrating course where, through analysis of a series of case problems from the top management viewpoint, the student is given practice in arriving at effective courses of action to solve business problems. To complete this course satisfactorily the student will be required to draw upon the institutional knowledge and techniques acquired in the other courses in the department. Prerequisites: Business Administration requirements through the junior year. 3 s.h. (w) Joerg

DEPARTMENTAL MAJORS

The Department of Economics and Business Administration offers specialization in three major areas—Accounting, Business Administration and Economics. Each program requires that the student take the same required prerequisite courses in the Freshman and Sophomore years.

A. Prerequisites required of all majors in the Department:

1. Mathematics 17 or 21 (Preferably Mathematics 21)
2. Economics 1 or 51 and 2 or 52.
3. Economics 57

B. Number of hours needed in each major area: 21 hours in addition to Economics 1 or 51 and 2 or 52 and Economics 57.

1. *Economics*
   Required courses: Economics 138, 149, 154
   Elective courses: Any 12 hours selected from the Economics section (not Accounting or Business Administration) of the Departmental course offerings. Economics 143 and 190 from the Business Administration section may also be offered to meet the Elective requirement.
2. *Business Administration*
   Required courses: Economics 58 (should be taken in Sophomore year)
   Economics 138, 143, 146, 291
   Elective courses: 6 hours selected from the following courses:
   Economics 144, 185, 190, 249
3. *Accounting*
   Required courses: Economics 58 (should be taken in the Sophomore Year).
   Economics 138, 143, 171, 172, 273, 275

C. Related work:

1. Number of hours required: 18 hours.
2. Departments in which related work is usually taken:
   Mathematics, the other social sciences, history, and psychology. In special cases courses taken in other departments may be counted as related work with the approval of the Department and the dean.

The Department offers work leading to graduation with distinction. See the section on Honors.

EDUCATION

PROFESSOR CARTWRIGHT, CHAIRMAN; PROFESSOR STUMPF, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BOLMEIER, GITHENS, HOPKINS, AND HURLBURT; ADJUNCT PROFESSOR HOWE; ASSOCIATE PROFESSORS COLVER, GEHMAN, JOHNSON, PETTY, RUDISILL, SHUMAN, SUBLETT AND WEITZ; ASSISTANT PROFESSORS BALLANTYNE AND MARTIN

Courses in the Department of Education are designed for two groups of students: (1) students who have definitely chosen teaching as their life work or others with teaching experience, and (2) students who desire to study the school as a unique social institution.

Students who expect to teach in the public schools should plan their courses in accordance with the general regulations set forth under Teaching. Students who intend to teach in elementary schools should advise with Professors Petty, Rudisill, Sublett, or Stumpf; those intending to teach in secondary schools should advise with Professors Cartwright, Githens, Hurlburt, Shuman, or Stumpf. Students should confer with these advisers prior to registration each semester.

Students who do not expect to teach but desire merely an understanding of the school as part of a liberal education are advised to elect such courses as 100, 113, 114 for their introductory work in the Department and then to elect further work in accordance with their special interests.

5. DEVELOPMENTAL READING.—A course consisting of study and practice for the improvement of the reading and study skills. Work is provided in such areas as vocabulary, speed of comprehension, critical interpretation, organization of ideas, and versatility of method in reading for different purposes. 3 s.h. (W)
MISS RUDISILL

68. MENTAL HYGIENE.—Development and application of psychological principles of adjustment to personal behavior. Study of factors in the development of personal adjustment as influenced by human relations in the home, school, and community. Not open to students who have had Psychology 115. 3 s.h. (E)
GEHMAN

100. SOCIAL FOUNDATIONS OF AMERICAN EDUCATION.—A study of the basic features, assumptions, viewpoints, and issues of education in contemporary America. This or 113 required of all who intend to practice teach and of all majors in Education. This course should be taken in the junior year. *Either semester.* 3 s.h. (E) JOHNSON, MARTIN, STUMPF, AND SUBLETT

101. ELEMENTARY EDUCATION: PRINCIPLES.—The nature, subject matter, and organization for instruction of elementary education in the primary and grammar grades. Required in the elementary-education major. 2 s.h. (E)
PETTY, SUBLETT

102. ELEMENTARY EDUCATION: PRACTICE.—Methods and problems of instruction in elementary education and their applications and solutions in the classroom. Required in the elementary-education major. Prerequisite: 2.0 average over-all and in the elementary-education major. 6 s.h. (E) PETTY, SUBLETT

105. ELEMENTARY EDUCATION: READING.—The process, methods, and materials basic to the teaching of reading in the elementary school. Required in school. Required in the elementary-education major. 2 s.h. (E) MISS RUDISILL

106. ELEMENTARY EDUCATION: LANGUAGE ARTS.—The processes, meth-

ods, and materials basic to the teaching of the language arts in the elementary school. Required in the elementary-education major. *Either semester.* 2 s.h. (E) MISS RUDISILL

107. ELEMENTARY EDUCATION: ARITHMETIC.—The processes, methods, and materials basic to the teaching of arithmetic in the elementary school. Required in the elementary-education major. 2 s.h. (E) PETTY

108. ELEMENTARY EDUCATION: SCIENCE.—The principles, methods, and materials basic to the teaching of the sciences in the elementary school. Required in the elementary-education major. 2 s.h. (E) GITHENS

113. HISTORY OF AMERICAN EDUCATION.—A study of American education from colonial times to the present. The development of schools, their organization, administration, curriculum, and methods as seen in relation to the social forces that have produced our particular type of civilization. 3 s.h. (E) JOHNSON

114. HISTORY OF EDUCATION IN EUROPEAN CULTURE.—A study of the evolution of the educational theory and practice from Greek civilization through 19th-century Europe. Emphasis will be placed upon the educational ideas of outstanding thinkers from Plato to Spencer. 3 s.h. (E) JOHNSON

118. EDUCATIONAL PSYCHOLOGY.—A study of the psychology of learning; individual and social development; and psychology of adjustment, as related to problems of instruction and the processes of education. Prerequisite: Psychology 91. 3 s.h. (E). BALLANTYNE, GEHMAN

142. CHILDREN'S LITERATURE.—Students may specialize in literature of either the primary or the grammar grades. 3 s.h. (E) MISS RUDISILL

151. PUBLIC SCHOOL MUSIC EDUCATION.—Required in the elementary-education major. See Music Education 151 for description.

152. PUBLIC SCHOOL MUSIC LITERATURE.—Required in the elementary-education major. See Music Education 152 for description.

153. VOCAL MUSIC IN THE PUBLIC SCHOOL.—See Music Education 153 for description.

154. INSTRUMENTAL MUSIC IN THE PUBLIC SCHOOL.—See Music Education 154 for description.

161. INTEGRATED ART IN THE PUBLIC SCHOOL.—Work in materials and methods applied in two-dimensional art. Required in the elementary-education major. *Either semester.* 2 s.h. (E) STARS

162. PLASTIC ART IN THE PUBLIC SCHOOL.—Work in basic three dimensional art, giving an understanding of different sculptural media with special emphasis on ceramics. The course is designed for students in elementary and secondary art education, and will provide credit toward the North Carolina Elementary and Secondary Teaching Certificates. 3 s.h. (E) STARS

201. TEACHING AND SUPERVISION OF ARITHMETIC.—Special attention is given to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. Considered also are the meaning theory, methods of teaching, problem solving, evaluation, practice and drill, and selection and graduation of arithmetical contents. This course is designed for teachers and supervisors in the elementary school. 3 s.h. (E) PETTY

203. PRINCIPLES OF SCHOOL ADMINISTRATION.—The fundamental facts and procedures of school administration, an analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. Prerequisite: six semester hours in education. 3 s.h. (E) BOLMEIER, HURLBURT, AND STUMPF

204. THE SCHOOL AS AN INSTITUTION.—Consideration is given to the place of the school in the American social order, and its adaptation to social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunities. 3 s.h. (E) BOLMEIER, MARTIN

210. INTRODUCTION TO EDUCATIONAL RESEARCH.—The general pur-

pose of this course is to give the student an overview of research, acquaint him with the nature of research processes, and develop within him an understanding of the essential characteristics of good research work. The course is designed to be liberalizing as well as technical. 3 s.h. (E) STUMPF

215. SECONDARY EDUCATION: PRINCIPLES.—Intensive study of principles, curriculum, and methods in secondary education. Accelerated course meeting six hours a week for half a semester. Prerequisite: 2.0 average over-all and in teaching field or fields. Must be accompanied by Education 216. *Either semester.* 3 s.h. (E) GITHENS, HURLBURT, SHUMAN

216. SECONDARY EDUCATION: INTERNSHIP.—Supervised internship in junior or senior high schools. Full-time observation and teaching for half a semester, accompanied by Education 215. Prerequisite: 2.0 average over-all and in the major or teaching field. *Either semester.* 6 s.h. (E) CARTWRIGHT, GITHENS, HURLBURT, SHUMAN

NOTE: Education 215, 216, 118, and one other course, depending on the student's field, constitute a semester's work during the senior year.

217. THE PSYCHOLOGICAL PRINCIPLES OF EDUCATION.—An advanced study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 3 s.h. (E) GEHMAN, WEITZ

225. THE TEACHING OF HISTORY AND THE SOCIAL STUDIES.—Evaluation of the objectives, content, materials and methods in the teaching of history and the social studies. 3 s.h. (E) CARTWRIGHT

226. TEACHING READING IN THE ELEMENTARY SCHOOL.—A study of the nature of the reading process and of principles, methods and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. Practice is provided with elementary-school children suffering reading retardation, in testing, diagnosis, and daily remedial teaching. 3 s.h. (E) MISS RUDISILL

228. IMPROVEMENT OF INSTRUCTION IN THE SOCIAL STUDIES.—An advanced treatment of curriculum, methods, and materials in the social studies. Individuals will concentrate on subjects and grade levels of their choice. 3 s.h. (E) F CARTWRIGHT

232. SUPERVISION OF INSTRUCTION.—A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to community needs. 3 s.h. (E) HURLBURT

234. SECONDARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 3 s.h. (E) BOLMEIER

235. THE NATURE, FUNCTION, AND REORGANIZATION OF THE CURRICULUM.—Selected problems, and guiding students' reading. 3 s.h. (E) CARTWRIGHT, SUBLETT

236. TEACHING READING IN THE SECONDARY SCHOOLS.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. For secondary-school teachers of all subjects who wish to improve the reading and study habits of their students. 3 s.h. (E) MISS RUDISILL

237. LITERATURE FOR ADOLESCENTS.—The course offers a critical survey of literature written for, or appropriate for junior and senior high school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 3 s.h. SHUMAN

239. METHODS AND PROBLEMS OF TEACHING ENGLISH IN SECONDARY SCHOOLS.—This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar and composition.

Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles in the field. Several short compositions and a report will be required. 3 s.h. (E) BOWMAN, SHUMAN

240. EDUCATIONAL AND OCCUPATIONAL INFORMATION.—A study of the sources of occupational and educational information: methods of securing and organizing occupational information; methods of providing vocational and educational information to students through career days, college conferences, class activities, and individual counseling; methods of making job analyses and community occupational surveys. 3 s.h. (W) COLVER

241. PRINCIPLES OF GUIDANCE.—An historical survey of the philosophies of guidance; a study of the interrelationships between instruction, administration, and guidance in education. Prerequisite: 6 hours of psychology or educational psychology. 3 s.h. (W) COLVER

243. PERSONALITY DYNAMICS.—A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 3 s.h. (E) GEHMAN

246. THE TEACHING OF MATHEMATICS.—This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. 3 s.h. (E) REYNOLDS

253. SCHOOL LAW.—The primary purpose of this course is to familiarize prospective school administrators and teachers with the legal features of school organization and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 3 s.h. (E). BOLMEIER

258. EDUCATIONAL MEASUREMENTS.—A critical study of the principles and techniques involved in measurement in education with opportunity for individual research. Prerequisite: 12 semester hours in the Department, including a course in educational psychology. 3 s.h. (E) COLVER, WEITZ

266. SCIENCE IN THE ELEMENTARY SCHOOL.—Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equipment, and field studies. 3 s.h. (E) GITHENS

276. THE TEACHING OF HIGH-SCHOOL SCIENCE.—Discussion, lectures and collateral reading related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for secondary-school science. 3 s.h. (E) GITHENS

290. ADMINISTRATION OF SCHOOL PROPERTY.—Planning and management of the school plant and its equipment to meet instructional and community needs for immediate and long-range purposes. This course is intended for teachers and principals as well as for superintendents. Areas to be treated include site selection; trends in design, lighting, ventilation and heating; custodial service and maintenance; and financing. 3 s.h. (E) STUMPF

DEPARTMENTAL MAJOR

The only undergraduate major in Education at Duke University is that in elementary education.

The Department offers work leading to graduation with distinction. See the section on Honors in this *Bulletin*.

MATERIALS AND METHODS COURSES

Certain courses concerned with materials and methods in teaching the various subjects in the public school curriculum are listed in the proper subject matter department. These courses are intended to give credit on teaching certificates and are recommended by the Department of Education for such credit.

MAJORS IN ELEMENTARY EDUCATION AND SCIENCE EDUCATION

Students desiring to teach in elementary schools or in science in secondary schools should read the descriptions of these programs of study listed under the proper headings elsewhere in this *Bulletin*.

ENGINEERING

For courses in Civil, Electrical, and Mechanical Engineering, see pages 138-146.

ENGLISH

PROFESSOR STEVENSON, CHAIRMAN; ASSOCIATE PROFESSOR FERGUSON, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR L. PATTON, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS BLACKBURN, BOWMAN, BOYCE, DUFFEY, GOHDES, KNIGHT, LIEVSAY, LUMIANSKY, NYGARD, SANDERS, TURNER, AND WARD; ASSOCIATE PROFESSORS ANDERSON, BEVINGTON, BUDD, HARWELL, HENINGER, REARDON, SMITH, WETHERBY, AND WILLIAMS; ASSISTANT PROFESSORS CLOGAN, JONES, JORDAN, KRUEGER, MICHALAK, POTEAT, PRICE, RANDALL, RIDDEL, SCHWERMAN, AND VAN KLUYVE; VISITING LECTURER F. PATTON; INSTRUCTORS GERBER, HOLLAND, JENNINGS, MOORE, AND ROBINSON; MISSES COBLE, DORMAN, HILLS, AND KIRBY-SMITH; MESSRS. ANDREWS, ARPAD, BABIN, CONE, DUNN, FISHER, GRAVES, HARRIS, HENSLEY, HERNDON, HOLMES, KAUVAR, LAVIA, LENTRICCHIA, LUDINGTON, MCILWAINE, MASCITELLI, MITCHELL, NEUBAUER, PRIDGEON, RAND, ROCKS, SCHWARZ, SPIVEY, VAN, WATSON, AND WHISNANT

1-2. FRESHMAN COMPOSITION.—Training in composition through the writing of weekly expository themes. The theme subjects derive from assigned reading drawn from British and American literature of the Twentieth Century. English 1 takes up the Essay, the Short Story, and the Novel; English 2, the Play and the Poem. The student attends each week (1) a general lecture on the reading for the week; (2) a section meeting, where the instructor and a small group discuss problems of composition and literature; and (3) an individual conference in which the instructor reads and grades the weekly theme and makes special assignments according to the needs of the student. 6 s.h. (E & W) STAFF

53. ADVANCED GRAMMAR AND WRITING.—Emphasis is placed first on the student's mastering the fundamental principles of English grammar and the other essentials of correct writing. 3 s.h. (E) JORDAN

65-66. IMAGINATIVE WRITING.—A foundation course in imaginative writing, both prose and verse. Primarily for sophomores, but in special cases open to students from other classes. The consent of the instructor is required. 6 s.h. (E) MRS. PATTON AND SANDERS

93. TECHNICAL COMMUNICATION.—Emphasis will be placed on the writing of business letters, technical reports, and articles for submission to technical journals. Approximately one-third of the course will provide training in the oral presentation of various materials. Prerequisite: English 1 and 2. 3 s.h. (W) HARWELL AND STAFF

100. ENGLISH FOR FOREIGN STUDENTS.—Designed to assist the student to whom English is a second language to perfect his speaking and understanding of the language. Drills in writing, speaking, listening and the American idiom. Open to all students and their wives, and to any persons and spouses with an official connection with the University. Those who do not pay full-time student fees may register for a fee of $5.00. No credit. (W) WETHERBY

101. ADVANCED EXPOSITORY WRITING.—Designed for students interested in expository writing, this is a course in advanced composition. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (E) FERGUSON

103-104. NARRATIVE WRITING.—Class discussion of students' manuscripts, supplemented by a critical evaluation of selected short stories and a novel and by individual conferences with the instructor. Open to sophomores, juniors, and seniors. Students desiring admission to the course should present a piece of writing

to the instructor as early as possible in the spring semester. Prerequisite for English 104: English 103. 6 s.h. (E) BLACKBURN

SPEECH AND DRAMA

51. ESSENTIALS OF PUBLIC SPEAKING.—A basic course in public speaking, designed to give the student the poise and confidence necessary to think and speak freely before an audience. Particular attention is paid to the gathering and organization of speech materials and to oral presentation. Not open ordinarily to juniors and seniors. 3 s.h. (W) MICHALAK, REARDON, AND MISS SCHWERMAN

118. PERSUASIVE SPEAKING.—The psychological and sociological techniques used in gaining acceptance of ideas through speech. Study is made of the factors influencing human behavior; audience analysis and motivation; choice, arrangement, and adaptation of material. Extensive practice in persuasive speaking. Prerequisite: English 51 or 151 or consent of the instructor. 3 s.h. (W) WETHERBY

119. HISTORY OF THE THEATER.—The origin and development of drama, acting, and stagecraft from ancient Greece to the modern European and American theater. Production problems of representative plays of the various periods will be discussed. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (W) MICHALAK

121. STAGECRAFT.—An introductory course on the technical aspects of play production: scenery, lighting, properties, make-up, and costuming. Laboratory work will be coordinated with the various productions of the Duke Players. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (E) MICHALAK

122. PLAY PRODUCTION.—An introduction to the methods of producing a play; theater organization, play selection, casting, and rehearsal. Lectures and laboratory. Primarily for juniors and seniors; open also to sophomores approved by the instructor. 3 s.h. (E) MICHALAK

139. THE SPEAKING VOICE.—A study of the mechanisms of speech. Emphasis is placed on providing the skills necessary for the improvement of voice, pronunciation, and diction. Methods of correcting minor functional speech disorders will also be studied. 3 s.h. (W) MISS SCHWERMAN AND WETHERBY

150. ORAL INTERPRETATION OF LITERATURE.—A study of poetry and certain types of prose, with practice in the technique by which they may be communicated to an audience. 3 s.h. (W) MISS SCHWERMAN

151. ESSENTIALS OF PUBLIC SPEAKING.—A basic course in public speaking for juniors and seniors dealing with the same matters as 51. (Not open for credit to students who have taken 51.) 3 s.h. (E & W)
MICHALAK, REARDON, AND MISS SCHWERMAN

152. ARGUMENTATION.—The principles of argumentation and debating. The techniques of analysis, investigation, evidence, reasoning, brief making, and refutation. Participation in class discussions and debates. Prerequisite: English 51 or 151 or consent of the instructor. 3 s.h. (W) WETHERBY

171, 172. BROADCASTING.—A study of the background of radio and television broadcasting. The first semester covers the development of broadcasting as an industry and as a literary form. The second semester studies the legal and social aspects, and the various program forms. 6 s.h. (W) WETHERBY

ENGLISH AND AMERICAN LITERATURE AND LANGUAGE

55, 56. REPRESENTATIVE BRITISH WRITERS.—The following works are studied in the first semester: Chaucer's Prologue to *The Canterbury Tales* and at least two tales, Shakespeare's *I Henry IV*, *Hamlet* or *King Lear*, and one other play, John Donne's poetry (selections), Milton's *Paradise Lost* (selections) and some of the shorter poems; in the second semester: novels by Fielding (*Joseph Andrews*), Dickens (*Great Expectations*), and Hardy (*The Mayor of Casterbridge*), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 6 s.h. (E & W) STAFF

57, 58. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works. The first semester will include Poe, Emerson or Thoreau, Hawthorne, Mel-

ville, Whitman, Dickinson, and Twain; the second will include James, Frost or Robinson, Crane or Dreiser, O'Neill, Faulkner, Hemingway, and others. 6 s.h. (E & W) STAFF

111, 112. EIGHTEENTH-CENTURY LITERATURE.—The writers emphasized in the first semester are Pope, Swift, Defoe, Addison, Steele, and Fielding; in the second semester, Johnson, Gray, Boswell, Goldsmith, Sheridan, the later novelists, and Blake. 6 s.h. (E) BOYCE, FERGUSON, AND WARD

117. MILTON.—Milton's poetry and prose, together with their relation to the period and to other great works of literature. 3 s.h. (E) LIEVSAY

123, 124. SHAKESPEARE.—In the first semester twelve plays, before 1600; in the second semester about ten plays, after 1600. 6 s.h. (E & W)
BOWMAN, HENINGER, RANDALL, WARD, AND WILLIAMS

125, 126. ENGLISH LITERATURE, 1789-1832.—The course begins with selections from the poetry of the forerunners of Romanticism. The chief emphasis in the first semester is on the work of the older Romantics: Wordsworth, Coleridge, Lamb, and Hazlitt. In the second semester the chief emphasis is on the work of the younger Romantics: Byron, Shelley, Keats, and DeQuincey. 6 s.h. (W) PATTON

127. THE ENGLISH NOVEL FROM THE BEGINNINGS TO 1800.—Some of the writers studied are Nashe, Deloney, Lyly, Sidney, Bunyan, Behn, Defoe, Richardson, Fielding, Smollett, and Sterne. (Not open for credit to students who have taken 157.) 3 s.h. (E) RANDALL

128. THE ENGLISH NOVEL IN THE NINETEENTH CENTURY.—Some of the writers studied are Scott, Austen, Dickens, Thackeray, Trollope, the Brontës, George Eliot, Meredith, Butler, and Hardy. (Not open for credit to students who have taken 157.) 3 s.h. (E) FERGUSON

129. THE ENGLISH NOVEL IN THE TWENTIETH CENTURY.—Some of the writers studied are Conrad, Lawrence, Forster, Joyce, Woolf, Huxley, Cary, Amis, and Golding. (Not open for credit to students who have taken 158.) 3 s.h. (E) SMITH

131, 132. ENGLISH LITERATURE, 1832-1900.—A study of the chief writers of poetry and prose from Carlyle to Yeats. The major writers studied in the first semester are Carlyle, Tennyson, Browning, Macaulay, Mill, and Newman; in the second semester, Arnold, Ruskin, the Rossettis, Morris, Swinburne, Pater, and Yeats. Collateral reading from novels of the period. 6 s.h. (E)
HARWELL, SANDERS, AND STEVENSON

133, 134. TWENTIETH-CENTURY POETRY.—A study of twentieth-century poetry and criticism of poetry in England and America. Problems in critical analysis and interpretation. First semester: the emphasis is on sources in nineteenth-century Symbolism and on the poetry of Hopkins, Yeats, Eliot, Pound, and Stevens. Second semester: the emphasis is on the poets and the poetic theories of the last thirty years. 6 s.h. (E) MRS. BEVINGTON

137, 138. AMERICAN LITERATURE.—A survey from colonial times to the present. Selections and complete novels by Hawthorne and Melville in the first semester; Twain, Henry James, Howells, and others in the second. (Not open for credit to students who have taken a matching semester of 57, 58.) 6 s.h. (E & W)
ANDERSON, BUDD, DUFFEY, AND RIDDEL

141. CHAUCER.—*The Canterbury Tales* and the minor poems, with attention to their literary and social background. 3 s.h. (W) LUMIANSKY AND VAN KLUYVE

142. ENGLISH LITERATURE OF THE MIDDLE AGES.—A study of the principal forms and examples of English prose, poetry, and drama of the Anglo-Saxon and Middle English periods (excluding Chaucer), read in translation. 3 s.h.

143, 144. ENGLISH LITERATURE: ELIZABETHAN AND SEVENTEENTH CENTURY.—A study of the poetry, prose, and drama of the period. First semester: the emphasis in poetry is on Wyatt, Sidney, Spenser, Raleigh, Shakespeare; in prose, on Sidney and Florio's Montaigne; in drama, on Marlowe. Second semester: the chief emphasis is on the metaphysical poets—Donne through Vaughan. Prose: Bacon, Burton, Donne, Browne. Drama: Jonson, Webster, Ford. 6 s.h. (E)
BLACKBURN

147. THE LITERARY EXPRESSION OF SCIENTIFIC THOUGHT.—Readings which delineate man's changing concept of nature, with emphasis on both the scientific thought and the literary merit of each text. Representative works of Hesiod, Plato, Aristotle, Lucretius, Descartes, Thomas Browne, Bertrand Russell, and others. Primarily for engineering students and majors in science. 3 s.h. (W) HENINGER

148. SATIRE.—An exploration of the nature and art of literary satire, based on examples, mostly English and American, of various forms and kinds; character-sketch, dialogue of the dead, fable, verse-narrative, eulogy, drama, novel, etc. Prerequisite: English 55, 56. 3 s.h. (E) BOYCE

150. ORAL INTERPRETATION OF LITERATURE.—See under "Speech and Drama."

153, 154. READINGS IN EUROPEAN LITERATURE.—Significant works are read in translation and related to similar works in English literature. The first semester includes selected writings of Homer, the Greek dramatists, Plato, Virgil, and Ovid. The second semester comprises works by Dante, More, Cervantes, Molière, Voltaire, Goethe, Dostoevski, Ibsen, and Kafka. 6 s.h. (W) HENINGER, KRUEGER, AND RANDALL

155. MODERN EUROPEAN DRAMA.—Continental and Irish plays from Ibsen to Brecht are read in relation to the modern drama of ideas and to the free theater movement. 3 s.h. (E) REARDON

156. MODERN ENGLISH AND AMERICAN DRAMA.—Plays from Pinero to Arthur Miller are read and discussed in relation to European origins and to the contemporary scene. 3 s.h. (E) REARDON

159. READINGS IN SCANDINAVIAN LITERATURE.—A study of selections in translation from Ibsen, Strindberg, Lagerkvist, and others; their place in the literary tradition of Scandinavia and their relationships with English and American literature. 3 s.h. (W) ANDERSON

161. DEVELOPMENT OF THE ENGLISH LANGUAGE.—An elementary historical study of the English language: patterns of change and growth, with some attention to methods of philological inquiry and the relations of philology to literary studies. 3 s.h. (E)

162. MODERN ENGLISH GRAMMAR.—A descriptive study of written and spoken American English of the present time, with attention to standards of usage and pronunciation and the relations of grammar to composition. 3 s.h. (E) CLOGAN

165, 166. AMERICAN FICTION.—A survey of the novel and the short story. The first semester covers the nineteenth century, from Washington Irving to Stephen Crane; the second covers the twentieth century through ten representative books. 6 s.h. (W) BUDD

167, 168. THE EUROPEAN EPIC TRADITION.—The development of the Epic tradition seen through detailed analysis of the major texts and major themes: Homer, Vergil, *Beowulf*, Dante, Cervantes, Milton, Tolstoy, Joyce. Prerequisite for 168: 167. 6 s.h. (W) (Not offered in 1965-66.) KNIGHT

181. CONFERENCE ON DRAMA.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

182. CONFERENCE ON POETRY.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

183. CONFERENCE ON FICTION.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

184. CONFERENCE ON PROSE NON-FICTION OR A SPECIAL TOPIC.—Primarily for majors, with priority given to seniors. Emphasis on literary theory and critical writing. 3 s.h.

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the Department. See p. 38. 6 s.h.

197-198. SENIOR SEMINAR IN ENGLISH.—A course designed to offer guidance in the analysis and interpretation of English and American literature to

students of superior ability. Comparative studies will be encouraged, and considerable reading will be required in critical and aesthetic theory. Emphasis will be placed upon the final essay. Admission by invitation of the Department. 6 s.h. (E & W) BLACKBURN AND PATTON

FOR SENIORS AND GRADUATES

203. CHAUCER.—The minor poems, *Troilus,* and *The Canterbury Tales.* 3 s.h. (W) LUMIANSKY AND NYGARD

207. OLD ENGLISH GRAMMAR AND READINGS.—3 s.h. (W) LUMIANSKY AND NYGARD

208. HISTORY OF THE ENGLISH LANGUAGE.—A survey of the language from Old to Present English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 3 s.h. (W) LUMIANSKY AND NYGARD

209. PRESENT-DAY ENGLISH.—A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; semantic change; the relation of the written to the spoken language; usage. 3 s.h. (W) NYGARD

213. INTRODUCTION TO FOLKLORE.—A survey of the materials of popular tradition, the folksong, the folktale, the proverb, the riddle, and other forms; the methods of folklore investigation; and the relation of these popular genres to literary tradition. 3 s.h. (W) NYGARD

215, 216. ELIZABETHAN DRAMA.—Study of one or two major dramatists (Jonson or Beaumont and Fletcher) and extensive reading in other writers (Heywood, Ford, Massinger, Marlowe, Middleton) with emphasis on the nature and qualities of their work in relation to its historical background. 6 s.h. (W) LIEVSAY

217. MILTON.—Milton's poetry and prose, with emphasis on the major poems. 3 s.h. (W) LIEVSAY

218. SPENSER.—The reading of Spenser's works, with chief attention to *The Faerie Queene.* 3 s.h. (W) HENINGER

219, 220. THE EIGHTEENTH CENTURY.—Swift, Pope, Defoe, Addison, Steele, and others are studied in the first semester; in the second, Gray, Johnson, Boswell, Collins, Goldsmith, the novelists and other writers. 6 s.h. (W) BOYCE AND FERGUSON

221, 222. ENGLISH LITERATURE OF THE EARLY NINETEENTH CENTURY.—The Romantic poets and prose writers from Scott to the early Carlyle, with special attention to Wordsworth, Coleridge, and Keats. 6 s.h. (W) SANDERS AND STEVENSON

223, 224. ENGLISH LITERATURE OF THE LATER NINETEENTH CENTURY.—The first semester is devoted chiefly to Carlyle, Dickens, Thackeray, Tennyson, and Browning; the second semester to Arnold, Ruskin, Pater, George Eliot, Meredith, the Pre-Raphaelites, and Swinburne. 6 s.h. (W) SANDERS AND STEVENSON

227. LITERARY CRITICISM.—Readings from the major critics, Plato to the present, with emphasis on formative ideas and historical continuity. 3 s.h. (W) LIEVSAY

229, 230. AMERICAN LITERATURE, 1800-1865.—The writers emphasized in the first semester are Emerson, Thoreau, and Hawthorne; in the second semester, Poe and Melville. 6 s.h. (W) BUDD AND TURNER

233, 234. AMERICAN LITERATURE, 1865-1920.—Selected works of representative authors of the period. The first semester's assignments will include Whitman, Lanier, Mark Twain, James, Howells, Emily Dickinson, Henry Adams, and the Local Colorists; the second semester's Crane, Norris, Moody, London, Dreiser, Edith Wharton, Willa Cather, O'Neill, Robinson, and Frost. The lectures will deal primarily with literary trends as shaped by the social background. 6 s.h. (W) GOHDES

235, 236. AMERICAN LITERATURE SINCE 1920.—First semester, selected fiction from Sherwood Anderson to the present and the Imagist movement in poetry. Second semester, later poetry and consideration of recent drama. 6 s.h. (W) DUFFEY

237. ENGLISH DRAMA, 1642-1800.—The heroic play and the comedy of man-

ners of the Restoration; the important plays, serious and comic, of the eighteenth century. 3 s.h. (w) WARD

239. SHAKESPEARE.—The plays and poems. 3 s.h. (w) WILLIAMS

244. LITERARY BIOGRAPHY.—Selected works from Plutarch to Strachey with discussion of the historical development of biography, the various methods it has used, and the various theories which have been held about it. 3 s.h. (w) SANDERS

251, 252. ENGLISH LITERATURE IN THE SEVENTEENTH CENTURY.—Major works in prose, poetry, and drama from 1600 to the death of Dryden. 6 s.h. (w) WARD

261, 262. ENGLISH LITERATURE OF THE TWENTIETH CENTURY.—Representative work of leading writers from 1900 to 1950, in fiction, drama, and poetry. The first semester will include Shaw, Conrad, Yeats, Wells, Bennett, Galsworthy, Ford, Synge, Forster, and Lawrence; the second semester, Joyce, Woolf, Edith Sitwell, Eliot, Huxley, Graves, Bowen, Auden, and Dylan Thomas. Critical analysis of selected texts, with discussion of techniques and ideas. 6 s.h. (w) SMITH

264. MAJOR DEVELOPMENTS IN CONTEMPORARY AMERICAN POETRY.—The principal contributions to modern poetry made by American poets, including imagism and the new poetry; Eliot, Stevens, Hart Crane, the "Fugitives," and a selection from the poets of the present generation. 3 s.h. (w)

266. RECENT CRITICAL THOUGHT.—Questions of the nature and value of literature as reflected in recent criticism, theoretical and practical. 3 s.h. DUFFEY

269, 270. SOUTHERN LITERATURE.—The principal authors and the chief literary developments from the beginnings to the present. Emphasis in the first semester is on Byrd, Kennedy, Simms, Poe, Timrod, and the humorists; in the second on Lanier, Harris, Cable, Mark Twain, Ellen Glasgow, and Faulkner. Attention is given to the historical and cultural background and to literary relations extending outside the region. 6 s.h. (w) TURNER

277. ENGLISH PROSE OF THE SIXTEENTH CENTURY.—Readings in the major forms and authors. 3 s.h. (w) LIEVSAY

278. ENGLISH NON-DRAMATIC POETRY OF THE SIXTEENTH CENTURY.—Extensive select readings from representative types and authors, excluding Spenser. 3 s.h. (w) HENINGER AND LIEVSAY

DEPARTMENTAL MAJOR

Prerequisite: English 55-56.

Major Requirements: Twenty-four semester hours above the sophomore level in writing, speech, drama, literature, and language; at least eighteen hours must be in English and American literature meeting the following requirements of distribution:

1. Six hours at the junior-senior level (generally to be taken in the junior year) in one of five designated period courses (143-144, 111-112, 125-126, 131-132, 137-138).
2. Three hours in one of the major authors: Chaucer, Shakespeare, or Milton (141, 203, 123, 124, 239, 117, 217).
3. Six hours (to be taken in the senior year) in senior-graduate courses, numbered at the 200 level. These courses are to be chosen so that surveys of particular periods do not heavily duplicate in subject matter the courses taken in (1) above. Conference courses numbered 181 to 184 may be substituted for part or all of this requirement.
4. The remaining hours must meet the following distribution requirements:
   (a) Three hours of English literature before 1800, unless the requirement is met in (1) or (3) above.
   (b) Three hours of English literature after 1800, unless the requirement is met in (1) or (3) above.
   (c) Three hours of American literature, unless the requirement is met in (1) or (3) above.

Related Work: Eighteen semester hours, which may include appropriate courses in history, aesthetics, art, music, foreign languages and literature, literature in

translation, philosophy, religion, linguistics, and the teaching of English. Related work must be taken in at least two departments.

The Department offers work leading to graduation with distinction. See the section on Honors in this *Bulletin*.

FORESTRY

Students without a Bachelor's degree who are preparing for work in forestry as a profession should take the courses outlined under the Academic-Forestry Combination in the section on Requirements for Degrees. However, with the consent of the instructor in charge, certain forestry courses may be elected by students in other curricular provided they have had adequate preparation (see *Bulletin of the School of Forestry*).

Members of the sophomore, junior, and senior classes, whether or not registered in the Academic-Forestry Combination, may elect the following course:

52. PRINCIPLES OF FORESTRY.—Introduction to forestry in the United States; growth of trees and forests; social and economic problems in developing America's primary renewable natural resource; contribution of forests to the national economy. 2 s.h. (W) MR. WHITE

FRENCH

For courses offered in French, see *Romance Languages*.

GEOLOGY

PROFESSOR BERRY, CHAIRMAN; ASSOCIATE PROFESSOR HERON, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSORS FURBISH AND PILKEY; AND ASSISTANTS

All students who wish to take a B.S. degree in Geology must take an approved summer field course. This normally is taken during the summer of the junior year.

51. GENERAL GEOLOGY.—This course is designed to give a general view of the surface features of the earth, their origin, structure and materials. Illustrative materials are studied in the laboratory. Excursions are made to neighboring points where the principles of the science are studied in the field. Three one-hour lectures or recitations and one three-hour laboratory. 4 s.h. (E) HERON AND STAFF

52. GENERAL GEOLOGY.—This course is designed to give some knowledge of the chief events of the earth's history. Excursions will be made to suitable neighboring localities. Three one-hour lectures or recitations and one three-hour laboratory. Prequisite: Geology 51. 4 s.h. (E) HERON AND STAFF

57. GEOMORPHOLOGY.—A detailed study of the processes at work on the land surface and the topographic forms produced by them under different climatic conditions. This course includes practice in the interpretation of topographic maps. Three one-hour lectures or recitations and one three-hour laboratory. 4 s.h. (E) BERRY

103. FUNDAMENTALS OF MINERALOGY.—Principles of crystallography, crystal chemistry, crystal physics and mineral identification. Excursions will be made to neighboring mineral localities. Three one-hour lectures or recitations and one three-hour laboratory. Prerequisite: Chemistry 1, 2 or 2 only (may be taken concurrently). 4 s.h. (E) FURBISH

106. IGNEOUS AND METAMORPHIC ROCKS.—Silicate mineralogy, theory of origin and classification of igneous and metamorphic rocks and rock identification. Two one-hour lectures or recitations and one three-hour laboratory. Prerequisite: Geology 103. 3 s.h. (E) FURBISH

108. SEDIMENTARY ROCKS.—Authigenic and detrital minerals, theory of origin and classification of sedimentary rocks and rock identification. One one-hour lecture or recitation and one three-hour laboratory. Prerequisite: Geology 51. 2 s.h. (E) HERON

143. PRINCIPLES OF STRATIGRAPHY.—Theory of correlation, sedimentation and stratigraphic units. Three one-hour lectures or recitation. Prerequisite: Geology 52. 3 s.h. (E) STAFF

151. ECONOMIC GEOLOGY.—Study of world distribution, geologic occurrence and uses of important mineral deposits. Three one-hour lectures or recitations and one three-hour laboratory. Prerequisite: Geology 103. 4 s.h. (E) BERRY

152. INTRODUCTORY PALEONTOLOGY.—Systematic study of invertebrate paleontology, dealing mainly with generic characters of the fossil invertebrates and their use in identifying and correlating geologic formations. Three one-hour lectures or recitations and one three-hour laboratory. Prerequisites: Geology 51, 52. 4 s.h. (E) BERRY

164. INTRODUCTION TO GEOLOGIC FIELD METHODS.—Principles and techniques used in geologic mapping and field studies including applicable methods of surveying and the use of aerial photographs. Field excursions will be made when possible. Two hours of lectures and three hours of laboratory each week. Prerequisites: Geology 51 and 52. 3 s.h. (E) FURBISH

166. STRUCTURE.—Structural features of the earth's crust. Three one-hour lectures or recitations. Prerequisites: Geology 106, 143. 3 s.h. (E) STAFF

175, 176. MAJORS SEMINAR.—Review of current literature in selected fields of geology. Required of all majors: 175 in the spring of the Junior year; 176 in the spring of the Senior year. One hour per week. 2 s.h. (E) STAFF

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the Director of Undergraduate Studies. (See page 38.) 6 s.h.

FOR SENIORS AND GRADUATES

203. ADVANCED STRATIGRAPHY.—A survey of the Phanerozoic deposits of the world with special emphasis on type areas. 3 s.h. (E) STAFF

206. GEOLOGICAL OCEANOGRAPHY.—A survey of geological aspects of the oceans including sediment types, processes of sedimentation, geologic structures of the ocean basins, and bottom physiography. 3 s.h. (E) PILKEY

207. SEDIMENTARY PETROGRAPHY.—Systematic description and classification of sedimentary rocks. 3 s.h. HERON

222. SEDIMENTARY MINERALS.—Major detrital and authigenic minerals with emphasis on the clay minerals. 3 s.h. (E) HERON

234. MARINE GEOLOGY.—Ocean-floor topography, sediment transport and deposition. 3 s.h. (E) PILKEY

DEPARTMENTAL MAJOR

Prerequisites: Chemistry 1, 2, Geology 51, and 52.

Major Requirements: A.B. degree, a minimum of 24 hours of geology above the elementary courses (51, 52). B.S. degree, a minimum of 24 hours of geology above the elementary courses (51, 52) plus a summer field course.

Related Work: 1. Number of hours needed for A.B., 12 s.h.; for B.S., 18 s.h. 2. Required courses, Mathematics 21, 22. 3. Departments in which related work is usually taken, chemistry, mathematics, physics, zoology, and engineering.

GERMANIC LANGUAGES AND LITERATURE

PROFESSOR SALINGER, CHAIRMAN; VISITING PROFESSOR JACKSON; ASSOCIATE PROFESSOR SEYMOUR, DIRECTOR OF UNDERGRADUATE STUDIES AND SUPERVISOR OF FRESHMAN INSTRUCTION; ASSOCIATE PROFESSORS MAXWELL, PHELPS, AND WILLSON; ASSISTANT PROFESSOR DEINERT; INSTRUCTORS ALT, ARNDT, BESSENT, AND SCHLIEWIENSKY

1-2. ELEMENTARY GERMAN.—Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. 8 s.h. (E & W) SEYMOUR AND STAFF

63-64. INTERMEDIATE GERMAN.—Prerequisite: German 1-2 or equivalent. 6 s.h. (E & W) PHELPS AND STAFF

German 63-64 is prerequisite for 91, 92 and all 100 group courses.

91, 92. INTRODUCTION TO GERMAN LITERATURE.—A third-year course, completing the language requirement. Reading from representative German authors. 4 s.h. ALT AND BESSENT

107, 108. SCIENTIFIC GERMAN.—The German language as used in the various contemporary sciences. 4 s.h.

109, 110. GERMAN PROSE FICTION.—Origin and development of the German novel and short story with special emphasis on the nineteenth century. 4 s.h. PHELPS

115, 116. GERMAN DRAMA OF THE NINETEENTH CENTURY.—A study of leading dramatists from Kleist to Hauptmann. 4 s.h. SEYMOUR

117, 118. GERMAN CONVERSATION.—A course in writing and speaking German, restricted to German majors and other students by permission of the Department. 6 s.h. ALT AND SCHLIEWIENSKY

119, 120. SURVEY OF GERMAN LITERATURE.—German literature and its cultural background. First semester: From the beginnings to the romantic period. Second semester: From romanticism to the present. Lectures, reports and readings. 6 s.h. PHELPS AND WILLSON

125, 126. CONTEMPORARY GERMAN LITERATURE.—A study of representative works of the twentieth century. 4 s.h. DEINERT

131, 132. INTRODUCTION TO GOETHE.—The reading of his early novels and epics and works pertaining to his life. 4 s.h. SALINGER

133, 134. THE GERMAN LYRIC.—A survey of the development of German lyric poetry, principally from Klopstock to Rilke (with some attention to mediaeval and early modern poets), seen as poetic reflection of German thought. 4 s.h. SALINGER

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to qualified students in the junior year, by permission of the Department. See p. 38. 6 s.h. DEINERT, PHELPS, SALINGER, AND WILLSON

201, 202. GOETHE.—A study of his life and works in the light of his lasting significance to world literature. 6 s.h. SALINGER

203, 204. EIGHTEENTH CENTURY.—Eighteenth-century German literature in its relation to contemporary European philosophy. 6 s.h. PHELPS

205, 206. MIDDLE HIGH GERMAN.—The language and literature of Germany's first classical period. 6 s.h. SEYMOUR AND JACKSON

207, 208. GERMAN ROMANTICISM.—The course covers the entire field of German romanticism from 1800. 6 s.h. WILLSON

209, 210. KLEIST, GRILLPARZER, AND HEBBEL.—The development of the drama in Germany and Austria between Schiller and Naturalism. 6 s.h. SALINGER AND WILLSON

211, 212. HEINRICH HEINE AND HIS TIME.—Heine's life and thought, and the contemporary European culture. 6 s.h. SALINGER

213. NINETEENTH-CENTURY LITERATURE.—From the end of Romanticism through Realism. Readings from Mörike, Büchner, Hebbel, Stifter, Keller, Meyer, Storm and Fontane. 3 s.h. DEINERT

214. THE TWENTIETH CENTURY.—From Naturalism to the present, with emphasis on Hauptmann, Hofmannsthal, George, Rilke, Mann, Kafka, Hesse, Broch, Musil, Brecht and Benn. 3 s.h. DEINERT

215. SEVENTEENTH-CENTURY LITERATURE.—A study of the leading writers of the Baroque, seen against the background of their time. 3 s.h. DEINERT

216. HISTORY OF THE GERMAN LANGUAGE.—The development of the phonology, morphology and syntax of German from earliest beginnings to the present. 3 s.h. SEYMOUR

218. THE TEACHING OF GERMAN.—Critical survey of modern teaching techniques; intensive practice in solving problems encountered in the teaching of German on the secondary and college levels. Analysis and evaluation of textbooks and related audio-visual materials with special emphasis on the utilization of the language laboratory. 3 s.h. PHELPS

DEPARTMENTAL MAJOR

1. *Prerequisites:* German 1-2 and 63-64, or equivalent.

2. *Major Requirements:* Twenty-four semester hours in the German Department. Twelve of these must be selected from the 200 courses. The remaining twelve may be selected from any courses in the 100 group. German 107, 108 does not count toward the major. German 117, 118, and 119, 120 (as well as Linguistics 101) are highly recommended to any student majoring in the Department.

3. *Related Work:* Eighteen semester hours, chosen from the humanities with the approval of the Germanic Languages Department.

HEALTH AND PHYSICAL EDUCATION

TRINITY COLLEGE AND THE COLLEGE OF ENGINEERING

MR. CAMERON, DIRECTOR; PROFESSOR FRIEDRICH, CHAIRMAN OF PHYSICAL EDUCATION AND ASSISTANT DIRECTOR OF PHYSICAL EDUCATION; PROFESSOR FALCONE; ASSOCIATE PROFESSORS BLY, COX, HARRISON, AND PERSONS; ASSISTANT PROFESSORS BUEHLER, CHAMBERS, SKINNER; MESSRS. BUBAS, HAGLER, HARVEY, LUTZ, AND WATERS, OWENS, DALY

REQUIRED PHYSICAL EDUCATION FOR MEN

A student must complete four semesters of physical education to fulfill graduation requirements.

All students are given a medical and physical examination before registration. Students who have physical handicaps must register in Adapted Physical Education—PE 11 and PE 12. Students assigned to these classes will take work adapted to their particular needs and capacities.

Students not assigned to adapted physical education will register in P.E. 1 and P.E. 2—Foundations of Physical Education. The fall program for freshmen has been specifically designed to provide the student with a broader concept of the "how" and "why" of physical activity. It includes an extensive battery of tests and involves such activities as interpretations of health and fitness, training techniques, relaxation techniques, weight control, body mechanics and posture control. Students are given an opportunity to become acquainted with various sports activities such as Tennis, Golf, Badminton, Volleyball, Handball, Paddleball, Basketball and Swimming.

On the basis of the test results and other factors such as body type, students are guided into those areas which can best help them develop their physical potential and provide for their future needs.

During the second semester students will be involved in activities best suited for them. These activities include: Wrestling, Gymnastics, Swimming, Track and Field and Individual Development.

After a student has completed Physical Education 1 and 2, he may complete his physical education requirement by electing and satisfactorily completing two courses from the following individual and team sports: 51. Gymnastics; 52. Badminton–Team Games; 53. Basketball–Handball; 56. Advanced Swimming, Life Saving and Water Safety; 57. Tennis–Volleyball; 58. Golf. A fee of $10.00 for the semester, payable at the Treasurer's Office, is charged for course 58, Golf. P.E. 61 and 62—Sophomore adapted P.E. is offered for those students who are assigned to this course by the health center. P.E. 63—Individual Development. This course which is open to all students includes conditioning, posture, weight control, fundamental movements, and weight training.

172. RECREATIONAL LEADERSHIP.—Theories and philosophies of play and recreation with application to community, school and family situations. HARRISON

WOMAN'S COLLEGE

PROFESSOR MCCUE, CHAIRMAN; PROFESSOR LEWIS, DIRECTOR OF UNDERGRADUATE STUDIES; ASSOCIATE PROFESSOR EDDY, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSOR BOOKHOUT; ASSOCIATE PROFESSORS HOLTON AND UHRHANE; ASSISTANT PROFESSORS LLOYD, SPANGLER, WOODYARD, AND WRAY; INSTRUCTOR RAYNOR

A student must complete four semester hours of physical education in order to fulfill graduation requirements. Ordinarily work must be completed by the end of the sophomore year. Classes meet three times a week or the equivalent thereof.

Each semester is divided into halves. In general, indoor activities are taught during the two winter half-semesters and outdoor activities in the fall and spring.

Every student must take one course (half-semester) in dance and one in swimming if she is unable to pass the swimming test. The remaining work necessary to complete the requirement may be elected from the activities listed in this section.

All students are given a physical and medical examination upon entering and at any other time when deemed necessary. Classes in adapted physical education and light sports are arranged for those who should not take the more active work.

HEALTH AND PHYSICAL EDUCATION

SPECIAL FRESHMAN PHYSICAL EDUCATION

At the beginning of the year, after a series of tests has been given, each freshman is registered for the course she most needs, as determined by the test scores. Courses in sports fundamentals, fundamentals of rhythm, beginning swimming, and posture and movement are offered for those who need to improve their skills in these areas. Students whose test scores are satisfactory will enroll in classes with the sophomores.

After the first half-semester all freshmen and sophomores enroll in classes together.

PHYSICAL EDUCATION ACTIVITIES

Individual and dual sports: archery, badminton, bowling, diving, fencing, golf, life saving, light sports, riding, stunts, tumbling, and apparatus, swimming, tennis, first aid, instructors' life saving, water safety, track, and field.

Team sports: basketball, hockey, softball, volleyball, "rec" ball, speedball.

Dance: folk dance, modern dance, square dance, tap dance.

Developmental Activities: posture and movement, posture, fundamental rhythms, sports fundamentals, and conditioning exercises.

The courses listed in this section are open for credit as follows: P.E. 91, 101, 117, 119, 181-182, 185, Health Education 101-102 open only to students preparing to teach physical education, with the exception of 91 which is open for credit to students in the Elementary Teaching Program. Physical Education 105-106, 113, 114, and Health Education 131, 134, 140, and 170, are open to all undergraduate students, both men and women.

91. FIRST AID AND SAFETY IN PHYSICAL EDUCATION.—A study of measures which must be taken to insure maximum safety in physical education programs; principles and practices in the care and prevention of athletic injuries. 1 s.h. (E) MISS LLOYD

101. HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION.—A survey of the relationship between physical education and social, political, and religious ideals of different nations and periods. Principles upon which physical education is based. A study of the physical, emotional, and social development of children at different ages with implications for physical education. Analysis of successful teaching. 3 s.h. (E) MISS MCCUE

102. THE TEACHING OF PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS.—A study of methods and materials for teaching physical education to children. Discussion of principles of physical education and practice in teaching elementary school activities. Required of students in the elementary school teaching program. 2 s.h. (E) MISS LEWIS

105-106. METHODS AND MATERIALS IN RECREATION.—A course intended to familiarize students with recreation activities and methods of organizing groups in these activities. Recommended for students interested in camping, scouting, YWCA work, and religious education. Laboratory work includes practical leadership experience with a recreational club or group in a city organization. Fields covered are: Social Activities, Music Activities, Folk and Square Dancing, Games and Sports, Arts and Crafts, Drama Activities. Open to juniors and seniors without prerequisite. Students who have had 102 may take 106 without 105. 6 s.h. (E)
MISS HOLTON

113. MAMMALIAN ANATOMY.—A study of all organ systems with special emphasis an osteology, arthrology and myology. The cat is used as laboratory animal, but constant application is made to man. Not open to students who have had Zoology 53. Prerequisite: Zoology 1 and 2. 4 s.h. (E) MRS. BOOKHOUT

114. KINESIOLOGY.—A study of muscle function. Analysis of fundamental movements with emphasis on the development of normal posture and efficient body movement. Required of students taking the major in physical education. Prerequisites: Zoology 1 and 2, and P.E. 113 or Zoology 53. 3 s.h. (E) MRS. BOOKHOUT

117. PHYSICAL FITNESS AND INDIVIDUAL PHYSICAL EDUCATION.—An analysis of exercises designed to improve physical fitness of groups and to meet individual needs for which specific exercises are indicated. Theory of teaching individual and group gymnastics. 2 s.h. (E) MRS BOOKHOUT

119. ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION.—Curriculum building in physical education. The administration of class and intramural programs. Administrative problems such as budget, equipment, facilities, interschool athletics, legal aspects, and public relations. 2 s.h. (E)
MISS MCCUE

120. EVALUATION AND MEASUREMENT IN PHYSICAL EDUCATION.—History of evaluation and measurement in physical education. Elementary statistics and application of statistical procedure in testing. Familiarity with athletic achievement tests for elementary and secondary schools, and with testing of sport techniques, rhythm, and general qualities of motor ability, motor capacity, and motor educability. 2 s.h. MRS. BOOKHOUT

181-182. METHODS AND MATERIALS IN PHYSICAL EDUCATION.—Includes basic theory and practice in teaching various types of dance, games, and sports. Laboratory hours are arranged to provide practice on the field and in the gymnasium. 6 s.h. (E) MISS LEWIS AND STAFF

185. ADVANCED METHODS AND MATERIALS IN PHYSICAL EDUCATION.—A continuation of 181-182. Required of senior majors in physical education. 3 s.h. (E) MISS LEWIS AND STAFF

HEALTH EDUCATION

101-102. HEALTH EDUCATION FUNDAMENTALS, METHODS, AND MATERIALS.—Designed specifically for and open only to physical education majors. Basic studies in personal and community health; administration; curriculum and program planning; health services and health counseling; selection, purchase, and care of equipment; library sources; methods and materials for effective health teaching; evaluation techniques and procedures. 6 s.h. (E) MISS UHRHANE

131. HEALTH PROBLEMS IN THE TWENTIETH CENTURY.—Examination of such topics as: mental health, use and abuse of alcohol and drugs; radiation hazards; atmospheric pollution; population explosion, mobility and migration; basic health and fitness; consumer evaluation and judgment in regard to health services, products and information. Open to sophomores. 3 s.h. (E) MISS UHRHANE

134. SCHOOL HEALTH.—Organization and administration of the school health program; basic health problems in schools; methods and materials for teaching health education. Primarily designed for students preparing to teach in elementary and secondary schools and for physical education majors. Open to juniors and seniors only. 2 s.h. (E) MISS UHRHANE

140. GEREOLOGY AND HEALTH.—Designed to help the college age person understand and appreciate the health problems of aging. Topics to be considered

will include: emotional health implications in the changing role of the aged in our society; housing plans, nursing homes and medical care; health problems related to the degenerative diseases, accident hazards; nutrition; and health implications of retirement and leisure time activities. Open to sophomores. 3 s.h. (E)
MISS UHRHANE

170. SPECIAL HEALTH PROBLEMS.—This course emphasizes economic, cultural and physical interrelationships operative in the creation and solution of health problems in: housing and city planning, water and waste control, food production and distribution, world health; and the effects on well-being of: killing and crippling diseases, handicapping conditions, medical care, philanthropic giving. Open to juniors and seniors only. 3 s.h. (E) MISS UHRHANE

REQUIREMENTS FOR TEACHING PHYSICAL EDUCATION AND HEALTH IN PUBLIC SCHOOLS

The following requirements have been set up for students in the Teaching Program who wish to qualify as full-time teachers of Physical Education and Health. The requirements meet the standards of the North Carolina Department of Public Instruction for certification in Physical Education and Health and of many of the other states represented in the student body. Students preparing to teach in any state are advised to consult the Department of Education about specific requirements.

Prerequisites: Physical Education 91 and 101. Zoology 1-2.

Major Requirements: 24 s.h. including Physical Education 114, 117, 119, 120, 181-182, 185, and Health Education 101-102.

Related Work: Sufficient work in subjects required for certification for teaching Physical Education and Health. Of these, 8 hours must be in anatomy and physiology (P.E. 113, Mammalian Anatomy, and Zoology 151, Principles of Physiology). For the remaining hours work done in the Department of Education leading to teacher certification is acceptable. Courses in health education, chemistry, zoology, sociology, psychology, art, music, and physical education are recommended.

HINDI-URDU

181, 182. INTENSIVE ELEMENTARY HINDUSTANI.—Four hours of classroom work, two hours of language drill. Concentration on the acquisition of conversational ability in Hindustani, with a grammar and vocabulary basic to both Hindi and Urdu. Introduction to the Devanagari script, and the reading of graded texts. 8 s.h. SWAN

183, 184. INTENSIVE INTERMEDIATE HINDUSTANI.—Four hours of classroom work, two hours of language drill. Advanced conversation in Hindustani. Reading and Composition. Introduction to the Nastaliq script. (Prerequisite: Elementary Hindustani.) 8 s.h. SWAN

HINDI 185, 186. ADVANCED HINDI READING AND COMPOSITION.—An introduction to scholarly and literary Hindi prose, and extensive practice in composition. Prerequisite: Hindustani 183, 184, or equivalent. 6 s.h. SWAN

200, 201. SPECIAL STUDIES IN SOUTH ASIAN LANGUAGES.—Intensive concentration in advanced Hindi reading and conversation, or specialized, graded work in cognate South Asian languages necessary for the advanced student contemplating field work in South Asia. Prerequisite: Consent of instructor. 6 s.h.
SWAN AND STAFF

These courses are offered as an enrichment program for students interested in the South Asian subcontinent and may be taken as general electives by advanced undergraduate students. No major work is offered in Hindi-Urdu.

HISTORY

PROFESSOR WATSON, CHAIRMAN; PROFESSOR COLTON, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR ROPP, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS ALDEN, CRANE, CURTISS, FERGUSON, HAMILTON, HOLLEY, LANNING, MANCHESTER, NELSON, PARKER, AND WOODY; VISITING PROFESSOR MANSERGH; ASSOCIATE PROFESSORS ACOMB, DAVIS, DURDEN, HOLLYDAY, W. SCOTT, VAN AKEN, AND YOUNG; ASSISTANT PROFESSORS GILLIN, LERNER, AND A. SCOTT; INSTRUCTORS CELL, GINTER, MAUSKOPF, STAUDE, AND WALL; MR. HOHNER AND MR. KIRKLAND

The undergraduate courses in history are designed to afford (1) an introduction to the study of history by a consideration of the history of the modern world; (2) a more intensive study of general American history; (3) opportunities for more advanced study of phases of American, English, European, Hispanic-American, Russian, and Asian history.

Course 1-2 or 51-52 or the equivalent is a prerequisite for all other courses; courses 91 and 92 are prerequisite for all 100 and 200 courses in United States history. However, seniors with written permission from the instructor may take advanced American history courses without having had 91 and 92. Sophomores who took only one semester of course 1-2 in the freshman year may take courses 91, 92, 95, 96 or 99 concurrently with the second semester, provided they made a grade of B or above on the semester taken. Sophomores must obtain permission of the instructor in order to be admitted to courses numbered above 100; students who are not fully qualified sophomores will not be admitted to these courses. Courses for seniors and graduates are limited to twenty-five students; juniors may not elect them without special permission from the Department and the Executive Committee of the Graduate Faculty.

1, 2. MODERN HISTORY.—With special reference to the issues in the modern world. Topics selected for emphasis: the contest between liberty and authority in the modern state; changing economic organization and theory—capitalism and the challenges to it; the problems of peace and war among the states; the changing faiths men live and die by. Beginning about 1500 with the rise of the European dynastic states, the story is pursued in the first semester to approximately 1848, and in the second through the two great world wars. The central theme in both semesters is the expansion of the influence of Western Europe throughout the world, with some attention to the rise of the United States as a world power. 6 s.h. (E & W)

Sophomores and juniors are not admitted to this course.

FERGUSON, MANCHESTER, AND ROPP; MISS ACOMB, HOLLYDAY, AND YOUNG; GILLIN AND LERNER; CELL, GINTER, KIRKLAND, MAUSKOPF, STAUDE, AND WALL

51, 52. MODERN HISTORY.—An introductory course for sophomores, juniors, and seniors dealing with the topics indicated in the description of course 1-2. 6 s.h. (E & W) PARKER; MISS ACOMB, HOLLYDAY, W. SCOTT, AND YOUNG; CELL AND MAUSKOPF

51X, 52X. MODERN HISTORY.—For seniors who have had no other history at Duke. The topics covered will be essentially the same as those indicated in the description of History 1-2. 6 s.h. (W) ROPP

91. THE DEVELOPMENT OF AMERICAN DEMOCRACY TO 1865.—A study of the trends vital to an understanding of the United States today. The main theme is the development of American democracy. Problems of foreign policy, the growth of capitalism, political practices, social behavior, and conflicting ideals are considered in relation to this main theme. 3 s.h. (E & W)

HOLLEY; DAVIS, DURDEN, AND VAN AKEN; MRS. A. SCOTT; HOHNER AND WALL

92. THE DEVELOPMENT OF AMERICAN DEMOCRACY, 1865 TO THE PRESENT.—A continuation of History 91 with emphasis upon the emergence of contemporary problems. 3 s.h. (E & W)

HOLLEY; DAVIS, DURDEN, AND VAN AKEN; MRS. A. SCOTT; HOHNER AND WALL

Courses 91 and 92 are intended both to serve as continuation courses in the study of history and to afford the student an opportunity to gain the understanding of the past of the United States essential for intelligent citizenship. These courses

are prerequisite for all 100 and 200 courses in United States history, but this prerequisite may be waived for seniors by written permission of the instructor.

95, 96. ANCIENT AND MEDIEVAL HISTORY.—The history of mankind from preliterate man through the development of the characteristic institutions of Western Europe. The first semester considers the prehistoric tribes, the early cultures of Mesopotamia and Egypt, the religious contribution of the Hebrews, and classical Greece and Rome. The second semester deals with Europe in the Middle Ages, from Constantine to Columbus, with emphasis upon institutional and cultural development. 6 s.h. (E) YOUNG

99. NAVAL HISTORY AND ELEMENTARY STRATEGY.—After a review of earlier periods, attention is given to the rise of sea-power and its importance in more recent times and to naval actions, especially in the two World Wars. This course is not open to students who have had N.S. 102. 3 s.h. (W) ROPP

105, 106. POLITICAL AND CONSTITUTIONAL HISTORY OF ENGLAND.—The origins and evolution of the principal institutions of the English government, related to their setting in a changing society. 6 s.h. (W) GINTER

107, 108. SOCIAL AND CULTURAL HISTORY OF ENGLAND.—English history from the fourteenth century to the present time in an effort to arrive at a synthesis of social and political events and thus provide a background for the study of English literature. Emphasis is placed on the ages of Chaucer, Shakespeare, and Milton; the eighteenth and early nineteenth centuries; the reign of Victoria and the twentieth century. 6 s.h. (E) FERGUSON

Sophomores who made an average grade of B or above on course 1-2 may be admitted to this course.

109, 110. HISTORY OF ROME.—History of the Roman State from its beginnings to the death of Justinian; its expansion; development of its constitution and public administration; social, legal, political and economic problems of perennial life and interest; the background and setting of Christianity's rise and growth. (This course carries no language credit. No knowledge of Latin is required for admission.) (Latin 131, 132) 6 s.h. (E) ROGERS

111, 112. AMERICA IN THE COLONIAL AND EARLY MODERN ERA.—Lectures upon the history of America from the discovery to the beginning of the Civil War. They will be primarily concerned with things political, institutional, and social, with occasional discussions of intellectual and cultural advance. 6 s.h. ALDEN

113, 114. AMERICA IN THE TWELFTH CENTURY.—Political, economic, and social problems of twentieth-century United States. Emphasis is placed on reform movements from the Muckrakers through the Fair Deal, the emergence of the United States as a world power, and conflicting ideas and ideologies. 6 s.h. (W) WATSON

121, 122. FOREIGN RELATIONS OF THE UNITED STATES, 1775 TO THE PRESENT (first semester to 1898).—With emphasis on social and economic currents as well as on diplomacy. 6 s.h. (W) DAVIS

123. CITY AND FRONTIER IN AMERICAN HISTORY 1607-1880.—The westward movement and the progress of urbanization with special attention to the social and political consequences. 3 s.h. (E) MRS. A. SCOTT

124. CITY AND FRONTIER IN AMERICAN HISTORY 1880 TO THE PRESENT.—A continuation of History 123 covering the later movement to the West and the urbanization of the post Civil War period. 3 s.h. (E) MRS. A. SCOTT

127. HISTORY OF LATIN AMERICA THROUGH THE FORMATION OF THE NATIONAL GOVERNMENTS.—3 s.h. (W) LANNING AND VAN AKEN

128. INTER-AMERICAN AFFAIRS.—This course treats the relations of the Latin-American states with each other and with the United States with the design of explaining the current significance of Latin America. Chief emphasis is placed upon social problems and movements common to all the republics and upon the role of the United States in Latin-American affairs, including such topics as American intervention; contributions of the United States to Latin-American life in such matters as public health; Pan-Americanism; Pan-Hispanism; foreign pene-

tration and ideologies; the cultural and commercial aspects of the Good Neighbor Policy; Latin-American states in the World Wars. 3 s.h. (w) Lanning

131, 132. THE DEVELOPMENT OF THE MAJOR SOUTH AMERICAN POWERS.—Political, social, and economic history of Argentina, Brazil, and Chile since independence. First semester to 1890; second semester to the present day. 6 s.h. Van Aken

135, 136. EUROPE IN THE TWENTIETH CENTURY.—Political, economic, and intellectual developments in Europe since 1900. First semester to 1933; second semester to the present day. 6 s.h. (w) Colton

137, 138. FOREIGN RELATIONS OF THE EUROPEAN POWERS.—European diplomacy and Europe's position in the world since 1870, with an introductory survey of diplomatic institutions since the Renaissance. 6 s.h. (w) W. Scott

139, 140. NINETEENTH-CENTURY EUROPE.—With special attention to Germany and Austria-Hungary, this course emphasizes the development of European nationalism and the clash of freedom and authority. 6 s.h. (w) Hollyday

141, 142. CHINA AND JAPAN IN MODERN TIMES.—A history of their response to the West between 1750 and the present, with some attention to their cultural background. 6 s.h. Gillin

147. THE HISTORY OF INDIA TO 1757: A SURVEY.—The history of the Indian sub-continent; classical Hindu civilization; the coming of Islam; the Mughal Empire; European penetration and rivalries; the establishment of British supremacy. 3 s.h. (w) Crane

148. THE HISTORY OF INDIA, 1757 TO THE PRESENT: A SURVEY.—The East India Company; British impact; the Indian Mutiny; the nature and effects of Crown Rule; Indian nationalism; Muslim nationalism; the Gandhian Era; the transfer of power; partition and independence; the contemporary scene. 3 s.h. (w) Crane

153, 154. THE HISTORY OF THE SOUTH.—A study, beginning in the Colonial period, of the development of the Southern part of the United States with particular attention to its distinctive characteristics and institutions and to their influence in shaping Southern attitudes toward major questions of national policy. 6 s.h. (w) Woody

157, 158. THE RISE OF MODERN SCIENCE.—A historical survey of the development of scientific ideas. First semester, science in antiquity to Galileo; second semester, seventeenth to twentieth century. 6 s.h. Mauskopf

161, 162. RUSSIA FROM IVAN THE TERRIBLE TO PRESENT TIMES.—Topics treated include the rise of the Russian state and its relations with Poland and Turkey; the agrarian problem and the rise of industry; the Russian Revolution; the political, agricultural and industrial policies of the Soviet Union; the role of the U.S.S.R. in World War II; and its postwar policies. 6 s.h. (w) Curtiss and Lerner

163, 164. REFORM AND POLITICS IN NINETEENTH CENTURY AMERICA.—First semester: the coming of the Civil War with emphasis on the reform movements of the Jackson era, and anti-slavery crusade and national politics to 1865. Second semester: reform and politics from the Reconstruction era to the Farmers' Revolt of the 1890's. 6 s.h. (w) Durden

FOR SENIORS AND GRADUATES

Students may receive credit for either semester of a hyphenated course at the 200-level without taking the other semester if they obtain written permission from the instructor and either the Director of Undergraduate or the Director of Graduate Studies.

201-202. THE HISTORY OF RUSSIA, 1801-1917.—The development of the Russian Empire in its political, social, and economic aspects, and the growth of forces leading to its downfall. 6 s.h. Curtiss

203-204. THE UNITED STATES, 1850-1900.—The rise of sectionalism, secession, war-time problems of the Union and Confederacy, political and economic adjustments of Reconstruction, the status of the Negro, the New South, problems of

capital and labor, the agrarian revolt, political parties and reform, the Spanish-American War. 6 s.h. (w) WOODY

205-206. THE UNITED STATES IN THE TWENTIETH CENTURY.—The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administrations. (Not open to students who have had History 113.) 6 s.h. (w) WATSON

212. RECENT INTERPRETATIONS OF UNITED STATES HISTORY.—A course designed to encourage a critical evaluation of major issues in United States history through examination of recent interpretations of key problems. 3 s.h. (w) WATSON

Open only to history graduate students and seniors doing practice teaching in one of their final two semesters.

213-214. THE OLD SOUTH.—Political thought and party trends from Jefferson to Calhoun; agriculture, slavery, expansion; commerce, manufacturing, transportation; urban life, religion, education; the rise of Southern nationalism. 6 s.h. (w) WOODY

215-216. THE DIPLOMATIC HISTORY OF THE UNITED STATES.—A study of the history of American diplomacy, with particular emphasis on those factors, foreign and domestic, which have shaped the foreign policies of the Republic. 6 s.h. (w) DAVIS

221-222. THE AGE OF THE RENAISSANCE.—The decline of characteristic features of medieval civilization and the rise of modern European institutions with particular attention to intellectual movements from Dante to Erasmus. 6 s.h. (E) NELSON

223-224. THE OLD REGIME AND THE FRENCH REVOLUTION, 1661-1815.—A study of social, political, and intellectual revolutions in continental Europe, centering on France and giving special attention to successive interpretations of historical change. 6 s.h. MISS ACOMB

225. THE AGE OF THE REFORMATION.—History and thought of European Christianity between 1517 and 1680. 3 s.h. [Listed also in the Department of Religion as Religion 250] HILLERBRAND

227, 228. EUROPE IN THE NINETEENTH CENTURY.—A study, beginning with the career of Napoleon Bonaparte, of the forces and personalities influential in the nineteenth century. Emphasis in the first semester is on the problems of the biographer; in the second, on those of a student of national communities. 6 s.h. (w) PARKER

229. RECENT INTERPRETATIONS OF MODERN EUROPEAN HISTORY.—A course designed to develop the ability to appraise critical historical issues through the study and discussion of recent interpretations of key historical problems in modern European history. 3 s.h. PARKER

Open only to history graduate students and seniors doing practice teaching in one of their final two semesters.

231-232. THE HISPANIC COLONIES AND REPUBLICS IN AMERICA.—6 s.h. (w) LANNING

233-234. THE INSTITUTIONAL, CULTURAL, AND SOCIAL HISTORY OF HISPANIC AMERICA.—The first semester deals with the culture, society, and institutions of the Spanish colonies in America and the second semester with those of the Hispanic American republics. 6 s.h. (w) LANNING

235, 236. EUROPEAN EXPANSION OVERSEAS (1415-1898).—A course dealing primarily with the processes by which European institutions were carried overseas and modified in a new environment. In the first semester the emphasis is on Portuguese, Dutch, French, and English experience in the Far East and the Americas to 1763. In the second semester, attention is paid to the emergence of independent centers of European culture, as in Brazil, and to the revivals of mercantile imperialism of the new German, French, Italian and British empires of the nineteenth century. 6 s.h. (w) MANCHESTER

237-238. EUROPE IN THE MIDDLE AGES, 395-1500.—Attention is given both to distinctive attributes of the period, such as feudalism and scholastic learning, and to such formative elements of European civilization as nationalism and the universities. 6 s.h. YOUNG

241-242. NATIONALISM AND COMMUNISM IN THE FAR EAST.—The growth of nationalism in China and Japan, culminating in Japan's invasion of China and the subsequent rise to power of the Chinese Communists. 6 s.h. GILLIN

245-246. WAR IN THE MODERN WORLD.—This course is concerned with the relations between warfare and modern political, economic, and social conditions. Special attention is given to the development of British and American military methods and to the events of the American Civil War and the two World Wars. The work in the first semester deals with Clausewitz's theories of warfare and the period from the introduction of gunpowder to 1871; in the second semester there is a more detailed analysis of recent land, sea, and air warfare. 6 s.h. (w) ROPP

247. THE HISTORY OF MODERN INDIA, 1757-1857.—Historiography of the period; the western impact on the sub-continent; the expansion of Company power; the background and nature of the Indian Mutiny; problems in historical analysis and interpretation. 3 s.h. (w) CRANE

248. THE HISTORY OF MODERN INDIA AND PAKISTAN, 1857-1947.—Historiography of the period; Crown rule; social change; modernization and the economy of the sub-continent; development of nationalism; the Gandhian era and Muslim separatism; the transfer of power and partition; problems of independence. 3 s.h. (w) CRANE

249-250. SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES.—The interplay of ideas and social practice through the examination of attitudes and institutions in such fields as science and technology, law, learning, and religion. 6 s.h. (w) HOLLEY

251-252. RECENT EUROPEAN HISTORY.—A history of political and economic developments in Western Europe since 1870. 6 s.h. (w) COLTON
Not open to students who have had 135, 136.

259-260. THE EMERGENCE OF THE NEW SOUTH 1865 TO THE PRESENT.—Reconstruction, industrialization, and agrarian revolt; changing status of the Negro; the South's role in the reform movements headed by Theodore Roosevelt, Woodrow Wilson, and Franklin D. Roosevelt. 6 s.h. DURDEN

261-262. RUSSIA SINCE 1917.—A study of the background of the Revolution of 1917 followed by an analysis of the history and policies of the Soviet state. 6 s.h. (w)
Not open to students who have had 161-162. LERNER

263-264. AMERICAN COLONIAL HISTORY AND THE REVOLUTION, 1607-1789.—The founding and institutional development of the English colonies; the background, progress, and results of the Revolution. 6 s.h. (w) ALDEN

265-266. MODERN SOUTH AMERICA.—Political, social, and economic history of the leading South American nations from the mid-nineteenth century to the present. 6 s.h. (w) VAN AKEN

267, 268. FROM MEDIEVAL TO EARLY MODERN ENGLAND.—The intellectual, social, and political problems of transition to modern England, with special emphasis on the English Renaissance. 6 s.h. (w) FERGUSON
Not open to students who have had 107.

269. BRITISH HISTORY FROM 1714 TO 1867.—The interrelationship of the leadership of such men as Walpone, Chatham, Pitt, and Peel with war, revolution, and social institutions; the rise of the cabinet system; the Industrial Revolution; imperial changes; and reform. 3 s.h. (w) HAMILTON

270. GREAT BRITAIN AND THE COMMONWEALTH OF NATIONS, 1867 TO THE PRESENT.—A history of Great Britain at the height of her world dominance and beyond, her oceanic empire, and the evolution of that empire into a unique world-wide Commonwealth of Nations. 3 s.h. (w) HAMILTON

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the formation of the

classical civilization of the Indian sub-continent from the prehistoric Indus Age to the Gupta Period (4th century A.D.). Attention will be given to the development of political, economic, social and religious movements and institutions. 3 s.h. [Listed also in the Department of Religion as Religion 285] SULLIVAN

297. THE BRITISH EMPIRE IN THE NINETEENTH CENTURY (FROM 1783).—3 s.h. (w)

298. THE COMMONWEALTH IN THE TWENTIETH CENTURY.—3 s.h. (w) MANSERGH

INDEPENDENT STUDY

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to juniors with a B average in History and in their over-all work. Admission will be subject to approval of the individual instructor and the Department. 6 s.h. STAFF

193, 194. INDEPENDENT STUDY.—Same as 191, 192, but for seniors. 6 or 12 s.h. STAFF

UNDERGRADUATE SEMINARS

Prerequisites: History 1, 2 (or 51, 52) and History 91, 92 (except for History 195A-196A) and the consent of the instructor.

The following seminars are designed to offer opportunities for reading and historical investigation in significant problems. Juniors as well as seniors may apply for admission to these courses, and are urged to do so if they expect to be candidates for graduation with distinction in history or if they expect to practice-teach in their senior year. All seminars are open to non-majors as well as to majors.

195A-196A. THE BACKGROUND OF MODERN EUROPEAN CIVILIZATION. —Topics in intellectual-cultural history of Europe and adjacent areas from the earliest records to 1648. The work aims to develop critical appreciation and maturity of judgment through using primary sources. 6 s.h. (E) NELSON

195B-196B. SEMINAR IN TWENTIETH-CENTURY EUROPE.—6 s.h. (w) *Students may not receive credit for this course and 251-252.* COLTON

195C-196C. PROBLEMS IN AMERICAN INTELLECTUAL HISTORY.—6 s.h. (w) HOLLEY

Students may not receive credit for this course and 249-250.

195D-196D. THE PROGRESSIVE ERA THROUGH THE NEW DEAL.—6 s.h. (w) WATSON

195E-196E. SEMINAR IN AMERICAN HISTORY BEFORE 1789.—6 s.h. (w) ALDEN

195F-196F. PROBLEMS IN NINETEENTH CENTURY AMERICAN REFORM AND POLITICS.—6 s.h. DURDEN

Students may not receive credit for this course and 163-164.

195G-196G. NATIONALISM AND COMMUNISM IN THE FAR EAST.—This course will combine general reading and discussion with occasional lectures and specialized research on the events and forces underlying developments in China, Japan, and other Far Eastern areas during the 19th and 20th centuries. 6 s.h. GILLIN

195H-196H. FROM RURAL TO URBAN SOCIETY IN THE UNITED STATES. —6 s.h. MRS. A. SCOTT

195I-196I. NATIONALISM AND FREEDOM IN NINETEENTH CENTURY EUROPE.—6 s.h. HOLLYDAY

195J-196J. THE HISTORY OF INTERNATIONAL SOCIALISM AND COMMUNISM.—International Socialist and Communist movements from Utopian Socialism to the present. 6 s.h. LERNER

197-198. SENIOR HONORS SEMINAR.—A course designed to introduce qualified students to advanced methods of historical research and writing and to the appraisal of critical historical issues. Open only to seniors, but not restricted to candidates for degree with distinction. This course, when taken by a history

major, would be in addition to the 6 semester hours required in 195-196 seminars or 200-level courses of the History Department. 6 s.h. HOLLEY AND PARKER

DEPARTMENTAL MAJOR

Prerequisite: The Introductory Course in History (1-2 or 51-52).

Major Requirements: Students desiring to take a major in history are required to elect, in addition to History 1-2 or 51-52, 24 semester hours in the Department, including six semester hours in either an undergraduate seminar (195-196) or any course in the 200 group. Students are urged to take History 91-92; in any case those wishing to take the more advanced courses in American history should elect History 91-92 in the sophomore or junior year.

Honors: Any student who is qualified (see the section on Honors in this *Bulletin* for general requirements) may undertake work leading to a degree with distinction in History by presenting himself to his History faculty advisor as a candidate. Normally, Honors work involves participation in one of the Undergraduate Seminars during the junior year and selection for the Senior Honors Seminar in the senior year. Further information is available at the History Department office (236 Allen).

COURSES APPROVED FOR RELATED WORK IN HISTORY

Art; History of Art
Economics, but not the courses listed under business administration and accounting except those in economic geography
Education, 54, 104, 225
English and American literature, but not composition, speech, and drama (except 119)
German, Greek, Latin, Russian, and the Romance Languages: the literature courses numbered 100 or above that are not primarily conversation or composition courses
Greek, Latin, except those courses that are primarily grammar or composition
Linguistics, 101
Music; History of Music
Philosophy, except 48
Political Science
Psychology, 91, 100, 101
Religion, especially those numbered above 100
Sociology

HONORS-MASTERS PROGRAM

For a brief description of this program see page 38 of this *Bulletin*.

COLLOQUIUM 101, 102. THE UNIVERSITY AND THE SCHOLAR.—Selected readings and informal discussions about such topics as the role of universities and teacher-scholars, the history of Duke University, the art of teaching, academic freedom, scholarly writing, and other related matters. 2 s.h.

ITALIAN

For courses offered in Italian, see *Romance Languages*.

LINGUISTICS

The courses in Linguistics may be taken as electives by advanced students; certain courses serve as related work in several departments (see the entries for related work under the separate departments).

No major is offered in Linguistics. Students interested in the study of language as a part of their undergraduate program or as a preparation for graduate work in linguistics should consult the instructors of the courses listed below.

101. INTRODUCTION TO LINGUISTICS.—Origin and nature of language, methods of descriptive linguistics with reference to historical and comparative linguistics. No specific prerequisite. Sophomore standing. 3 s.h. SEYMOUR

For a description of the following courses consult the listings under the specified department.

DEVELOPMENT OF THE ENGLISH LANGUAGE (English 161)
MODERN ENGLISH GRAMMAR (English 162) — CLOGAN
OLD ENGLISH GRAMMAR AND READINGS (English 207) — LUMIANSKY AND NYGARD
HISTORY OF THE ENGLISH LANGUAGE (English 208) — LUMIANSKY AND NYGARD
OLD FRENCH LITERATURE (French 219) — VINCENT
MIDDLE HIGH GERMAN (German 205, 206) — SEYMOUR
HISTORY OF THE GERMAN LANGUAGE (German 216) — SEYMOUR
PHILOSOPHY OF LANGUAGE (Philosophy 109) — WELSH
ROMANCE LINGUISTICS (Romance Languages 224) — HULL
CULTURAL ANTHROPOLOGY (Sociology 94) — LABARRE
LANGUAGE AND SOCIETY (Sociology 238) — MCCORMACK
OLD SPANISH LANGUAGE (Spanish 275) — DAVIS

MATHEMATICS

PROFESSOR GERGEN, CHAIRMAN; PROFESSOR DRESSEL, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR HICKSON, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS CARLITZ, ELLIOTT, MURRAY, ROBERTS, AND THOMAS; VISITING PROFESSOR NAGAMI; ASSOCIATE PROFESSORS GALLIE, REYNOLDS, SHOENFIELD, WARNER, AND WILLIAMS; ASSISTANT PROFESSORS BRYSON, BURDICK, HARRIS, HINRICHS, KELINGOS, KITCHEN, PATRICK, SCOVILLE, SMITH, AND STACKELBERG; MESSRS. BOOTH, CROCKETT, ELLIS, ENTWHISTLE, FRANKE, GALANTI, GORDON, KAIT, MACDONALD, MCINTYRE, MEANS, MULLEN, QUIMBY, SCHORR, TANK, WILDE, AND WUENSCH

The following program of courses in Mathematics is planned for 1965-66. Fall: 11, 17, 21, 22, 41, 63, 64, 83, 111, 113, 135, 139, 141, 183, 217, 221, 233, 235, 271, 283, 285, 287, 291. Spring: 18, 21, 22, 42, 63, 64, 84, 112, 114, 131, 136, 140, 142, 184, 204, 218, 221, 222, 234, 236, 244, 272, 288, 292.

11. ALGEBRA AND TRIGONOMETRY.—Factoring, fractions, linear equations in one or several unknowns, introduction to coordinates and graphing, exponents and radicals, numerical trigonometry. Prerequisite: two units of college preparatory mathematics. 3 s.h. (E & W) STAFF

17. INTRODUCTION TO FINITE MATHEMATICS.—A course designed to introduce students to some of the concepts in modern mathematics. Elementary logic, sets and subsets, vectors and matrices, and probability theory are studied. Some applications of these topics to the biological, social, and physical sciences are considered. Prerequisite: two and one-half units of college preparatory mathematics. 3 s.h. (W) STAFF

18. ELEMENTARY STATISTICS.—An introduction to statistics with emphasis on fundamental concepts. Topics studied include summarization of data, mean and standard deviation, normal, binomial and other distributions, sampling, statistical estimation, and testing hypotheses. Prerequisites: Mathematics 17. 3 s.h. (W) STAFF

21, 22. INTRODUCTORY CALCULUS.—Real and complex numbers, rectangular and polar coordinates, graphs, trigonometric and inverse trigonometric functions, logarithmic and exponential functions, conic sections, limits, derivatives, maxima and minima, methods of integration, areas, volumes. Prerequisite: two and one-half units of college preparatory mathematics. Mathematics 21 is prerequisite for Mathematics 22. 6 s.h. (E & W) STAFF

41, 42. INTRODUCTORY CALCULUS.—A special course covering the topics of Mathematics 21, 22 in a more extensive and rigorous fashion, designed for students who have demonstrated marked proficiency in mathematics. Credit for this course

and Mathematics 21, 22 is not allowed. Prerequisite: four units of college preparatory mathematics. 6 s.h. (w) STAFF

63, 64. INTERMEDIATE CALCULUS.—Moments, centroids, indeterminate forms, Taylor's formula, approximation of integrals, improper integrals, infinite series, vectors and solid analytic geometry, partial derivatives, multiple integrals, introduction to ordinary differential equations. Prerequisite: Mathematics 22 for 63; and 63 for 64. 6 s.h. (w) STAFF

83, 84. INTERMEDIATE CALCULUS.—A continuation of Mathematics 41, 42, with coverage including the topics of Mathematics 63, 64 and related basic topics in mathematics. Credit for this course and Mathematics 63, 64 is not allowed. Prerequisite: Mathematics 42 for 83; and 83 for 84; or permission of the Director of Undergraduate Studies in Mathematics. 6 s.h. (w) STAFF

111. APPLIED MATHEMATICAL ANALYSIS I.—Ordinary and partial linear differential equations with constant coefficients, Fourier series and their applications, vectors. Not open to students who have had Mathematics 131. Prerequisite: Mathematics 64. 3 s.h. (w) STAFF

112. APPLIED MATHEMATICAL ANALYSIS II.—Complex variables, residues, conformal mapping, matrices, Laplace and Fourier Transforms and their applications. Prerequisite: Mathematics 64. 3 s.h. (w) STAFF

113, 114. MODERN ALGEBRA.—Vector spaces, linear transformations, matrices, elementary theory of groups, rings, and fields. Prerequisite: Mathematics 63 for 113; and 113 for 114. 6 s.h. (w) HINRICHS

131. ELEMENTARY DIFFERENTIAL EQUATIONS.—Solution of differential equations of elementary types; formation and integration of equations arising in applications. Not open to students who have had Mathematics 111. Prerequisite: Mathematics 63. 3 s.h. (w) STAFF

135, 136. PROBABILITY AND STATISTICS.—Permutations and combinations, total and compound probability, Bayes' formula, Bernoulli's theorem, discrete distributions, central values, moments and mathematical expectation, law of large numbers, probabilities in continuum, continuous distributions, sampling distributions, confidence limits, tests of hypotheses, and analysis of variance. Prerequisite: Mathematics 63 for 135; and 135 for 136. 6 s.h. (w) BURDICK

139, 140. ADVANCED CALCULUS.—Multiple integrals and Jacobians, infinite series, power series, differential equations, vector analysis, line and surface integrals, Green's theorem, Stoke's theorem, improper integrals. Prerequisite: Mathematics 64 for 139; and 139 for 140. 6 s.h. (w) ELLIOTT

141, 142. JUNIOR MATHEMATICS SEMINAR.—An honors course designed to coordinate and advance the mathematical knowledge of students who have demonstrated marked proficiency in mathematics and who desire intensive and rigorous work in this subject. Student reports will be required. Prerequisite: Mathematics 84 for 141; and 141 for 142; or permission of the Director of Undergraduate Studies in Mathematics. 6 s.h. (w) KITCHEN

183, 184. SENIOR MATHEMATICS SEMINAR.—An honors course continuing the work in Mathematics 141, 142, designed primarily for seniors. Prerequisites: Mathematics 141 and 142 for 183; and 183 for 184. Mathematics 183 and 184 must be preceded or accompanied respectively by Mathematics 217 and 218. 6 s.h. (w) KITCHEN

FOR SENIORS AND GRADUATES

204. GEOMETRY FOR TEACHERS.—The metric and synthetic approaches to plane and solid geometry are investigated. Affine geometry and an algebraic model of Euclidean geometry are discussed. 3 s.h. REYNOLDS

217, 218. ANALYSIS.—Introduction to set theory, construction of real and complex numbers beginning with the Peano postulates, elementary topology of real and complex numbers, properties of continuous functions, derivatives, mean value theorem, Riemann integral, fundamental theorem of integral calculus. Prerequisite: Mathematics 64 for 217; and 217 for 218. 6 s.h. (w) KELINGOS

221. DIGITAL COMPUTER.—History of computers; number representation, in-

formation storage, logical arithmetic; components and organization of computing systems; coding and programming; programmed arithmetics, function and functional subroutines, interpretive routines, compilers; error analysis. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. The fee is payable to the Treasurer's Office of Duke University at the beginning of the semester. Prerequisite: Mathematics 22. 3 s.h. (w) PATRICK

222. INTRODUCTION TO NUMERICAL ANALYSIS.—Introduction to numerical analysis, error analysis, real and complex roots of equations, finite difference methods and theory of interpolation, numerical differentiation and integration, numerical integration of ordinary and partial differential equations, simultaneous equations and matrix inversion. Prerequisite: Mathematics 64 and 221. 3 s.h. (w) GALLIE

227, 228. THEORY OF NUMBERS.—Congruences, arithmetic functions, compound moduli, quadratic reciprocity, Gauss sums, quadratic forms, sums of squares. Prerequisite: Mathematics 64 for 227; and 227 for 228. 6 s.h. (w) CARLITZ

229, 230. ALGEBRAIC NUMBERS.—Ideals, unique factorization, divisors of the discriminant, determination of the class number. Prerequisite: Mathematics 113 for 229; and 229 for 230. 6 s.h. (w) CARLITZ

233. STATISTICAL METHODS.—Parameter estimation and hypothesis testing from samples, linear regression, correlation, analysis of variance and covariance, components of variance, multiple regression. 3 s.h. (w) BRYSON

234. SAMPLE DESIGNS.—Methods of constructing and analyzing survey designs; elements of simple random sampling, stratified sampling, multi-stage sampling; methods of estimation; questionnaire construction; refusals and not-at-homes. Prerequisite: Mathematics 233. 3 s.h. (w) BRYSON

235, 236. ABSTRACT ALGEBRA.—Groups, fields, rings, matrices, quadratic and bilinear forms, general Galois theory, hypercomplex systems. Prerequisite: Mathematics 64 for 235; and 235 for 236. 6 s.h. (w) THOMAS

244. DESIGN OF EXPERIMENTS.—Methods of constructing and analyzing designs for experimental investigation, Latin square, split-plot, simple and partially confounded factorial designs, incomplete block designs, treatment of missing data, techniques of experimentation. Prerequisite: Mathematics 233. 3 s.h. (w) BURDICK

247, 248. ARITHMETIC OF POLYNOMIALS.—Field theory, detailed study of finite fields, special polynomials and functions, valuation theory, the zeta function. Prerequisite: Mathematics 235 or consent of the instructor for 247; and 247 for 248. 6 s.h. (w) CARLITZ

253, 254. DIFFERENTIAL GEOMETRY.—Curves and surfaces in three dimensional Euclidean space, applicability, differential parameters, Riemannian geometry of n-space. Prerequisite: Mathematics 64 for 253; and 253 for 254. 6 s.h. (w) THOMAS

271, 272. INTRODUCTORY TOPOLOGY.—Topological properties of Euclidean spaces, set-theoretic and combinatorial methods. Prerequisite: Mathematics 64 for 271; and 271 for 272. 6 s.h. (w) HINRICHS

283. PROBABILITY FOR ENGINEERS.—Basic probability concepts, the sample space, discrete and continuous events, permutations and combinations, conditional and marginal probability, discrete and continuous distributions, estimation, hypothesis testing, confidence intervals, multiple regression, one-way analysis of variance. Prerequisite: Mathematics 64. 3 s.h. (w) BURDICK

285. APPLIED MATHEMATICAL METHODS I.—Vectors, line and surface integrals, tensors, complex variables, differential and integral equations. Prerequisite: Mathematics 64. 3 s.h. (w) DRESSEL

286. APPLIED MATHEMATICAL METHODS II.—Wave equation, Fourier series, heat equation, telegraphic equations, Legendre polynomials, Bessel functions, Schrödinger's equation. Prerequisite: Mathematics 64. 3 s.h. (w) DRESSEL

287, 288. FOUNDATIONS OF MATHEMATICS.—Propositional calculus, predicate calculus, axiomatized number theory. Gödel completeness and incompleteness

theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 64, or consent of instructor for 287; and 287 for 288. 6 s.h. (w) SHOENFIELD

290. APPLICATIONS OF STOCHASTIC PROCESSES.—Recurrent events, random walk, Markov chains and processes, queueing theory, branching and diffusion processes, Gaussian processes. Prerequisite: Mathematics 136 or 283. 3 s.h. WILLIAMS

291, 292. THEORY OF FUNCTIONS.—Limits, implicit functions, power series, double series, Cauchy's theorem and its applications, residues, Riemann surfaces, conformal mapping. Prerequisite: Mathematics 64 for 291; and 291 for 292. 6 s.h. (w) STACKELBERG

DEPARTMENTAL MAJOR

For the A.B. degree:

Prerequisite: Mathematics 21, 22

Major and Related Work: 42 semester hours.

Major Requirements: Mathematics 63, 64 and 18 semester hours in courses in mathematics numbered above 100.

Related Work: 18-24 semester hours of course work from the following departments: chemistry, economics and business administration, philosophy, physics. Two courses above the introductory level must be taken in at least one of these departments.

For the B.S. degree:

Prerequisite: Mathematics 21, 22.

Major and Related Work: 48 semester hours.

Major Requirements: Mathematics 63, 64 and 18 semester hours in courses in mathematics numbered above 100.

Related Work: 14-24 semester hours of course work in the natural sciences. Two courses above the introductory level must be taken in at least one of these departments.

The Department offers work leading to graduation with distinction. See the section on Honors in this *Bulletin.*

MEDICAL SCIENCE

This course in medical science has been approved by the Faculty Council as appropriate for the Bachelor's degree.

M201. ANATOMY AS RELATED TO LOCOMOTION.—The part of the body concerned with locomotion and posture will be dissected completely, whereas the thoracic, abdominal and pelvic organs, and the deeper structures of the head will be taught by means of audio-visual aids and prosections. September to January. Prerequisites: One year each of biology, chemistry, and physics. 6 s.h.

MARKEE AND EVERETT; BECKER AND DUKE

MUSIC

PROFESSOR BONE, CHAIRMAN; PROFESSOR MUELLER, DIRECTOR OF UNDERGRADUATE STUDIES; VISITING PROFESSOR HAMILTON; ASSOCIATE PROFESSORS BRYAN, HANKS, KLENZ, SAVILLE AND WITHERS; ASSISTANT PROFESSOR HENDRIX; VISITING ARTIST CIOMPI; INSTRUCTORS FISHBAUGH, FRIEDBERG AND HENRY; MMES. CUSHMAN, MCCALL AND PHELPS

Courses in music are offered both for the general student who wishes to acquire knowledge of music as literature and, on a more technical level, for those prepared to major in the field. The courses marked * are open to general students without prerequisite.

THEORY AND COMPOSITION

65-66. MUSIC THEORY I. *Harmony and Theory of Music.*—Manipulation and analysis of melodic, harmonic, rhythmic, contrapuntal and formal principles of

tonal organization through written exercises, ear training, sightsinging and keyboard harmony. Three lectures, two laboratory hours throughout the year. 8 s.h. (E) BRYAN, FISHBAUGH, AND FRIEDBERG

115-116. MUSIC THEORY II. *Advanced Harmony and Counterpoint.*—First semester, exercises in advanced harmonic techniques and studies in formal analysis; second semester, emphasis on contrapuntal techniques and writing in the smaller forms. Prerequisite: Music 65-66. Two lectures; two laboratory hours throughout the year. 6 s.h. (E) KLENZ AND FISHBAUGH

117, 118. MUSIC THEORY III. *Composition and Analysis.*—The development of technical and expressive means in various media and styles through practical exercises in composition and analysis of larger forms. The completion of an original work in an instrumental or choral medium. Prerequisite: Music 115-116 or consent of the instructor. 4 s.h. (E) HAMILTON

121. CONDUCTING.—The conducting of orchestral and vocal scores. Score-reading and analysis, principles of interpretation, establishment of vocal and instrumental conductoral techniques leading to practical experience in conducting the department musical organizations in rehearsal. Prerequisites: Music 65-66, 115-116 or consent of the instructor. 3 s.h. (E) BONE

122. ORCHESTRATION.—A study of the technical characteristics and transpositions of the instruments of the modern symphony orchestra and concert band. Instrumentation of piano scores of original compositions for string, woodwind, brass ensembles, and for full symphony orchestra or concert band. Prerequisites: Music 65-66, 115-116 or consent of the instructor. 3 s.h. (E) BONE

HISTORY AND LITERATURE

*1-2. INTRODUCTION TO MUSIC LITERATURE.—Rhythm, melody, harmony, form, instruments of the orchestra as principal elements of an effective listening technique. Selected works representing major composers of the Baroque, Classic, Romantic, and Contemporary periods are approached through the several performance media of song, orchestra, piano, chamber music, opera. Open only to freshmen; others, see Music 51-52 and 51X-52X. 6 s.h. (E) HENRY

*51-52. INTRODUCTION TO MUSIC LITERATURE.—The aims of this course are identical with those of Music 1-2; the content and method are adapted to the capacities of upperclassmen. Open only to upperclassmen who have not completed Music 1-2. 6 s.h. (E) STAFF

*51X-52X. INTRODUCTION TO MUSIC LITERATURE.—A special section for music majors and advanced general students. A historical, stylistic survey of music literature from 1600 to the present. 6 s.h. (E) MUELLER

*125. MASTERWORKS OF MUSIC LITERATURE.—An intensive study of selected masterworks which represent the principal currents in modern music history. Compositions by Bach, Mozart, Beethoven, Brahms, Debussy and Bartok will constitute a frame of reference for historical, biographical and stylistic analysis. 3 s.h. (E) HAMILTON AND MUELLER

*134. CHORAL LITERATURE.—A study of great choral works from the Renaissance to the present. The development of the mass, motet, cantata, oratorio, and passion, with attention to changing aesthetic and religious concepts as well as to formal and stylistic means. Intensive study of complete scores of composers selected from palestrina to Stravinsky; individual projects. 3 s.h. (F) SAVILLE
Not offered 1965-66.

135. PIANO LITERATURE.—A survey of the great works for keyboard instruments, from the time of the English virginal composers to the present. Prerequisites: Music 47A, 48A, 97A, and 98A, or consent of the instructor. 3 s.h. (E) WITHERS

136. SOLO SONG LITERATURE.—A study of selected standard repertoire: early Italian and English songs, German lieder; the French, English and American art song and the standard operatic aria. Open to voice students and others by consent of the instructor. 3 s.h. (E) HANKS

139. TWENTIETH CENTURY MUSIC.—The course will trace the most influential creative stylistic developments in music of the present century. A critical survey will emphasize works by key figures Bartok, Berg, Schonberg, and Stravinsky as a means of establishing a relative standard of values for subsequent independent exploration. Prerequisite: A one-year course in Music Theory or Literature, or consent of the instructor. 3 s.h. (E) HAMILTON

147-148. HISTORY OF MUSIC.—The history of the development of music as a manifestation of Western culture from mediaeval to modern times. The rise of Christianity through the Renaissance, first semester; the Baroque to the present, second semester. Prerequisite: A one-year course in Music Theory or Literature, or consent of the instructor. 6 s.h. (E) SAVILLE AND KLENZ

149. ORGAN LITERATURE.—A survey of the great works for organ from Bach to the present day. Interpretive analysis illustrated through performance whenever practicable. Attention will be given to problems of registration and style relating to the technical capacities of organ construction in each period studied. Emphasis on J. S. Bach, 19th century French and contemporary organ works. Open to organ students and others by consent of the instructor. 3 s.h. (W) HENDRIX

*163. MUSIC IN THE EIGHTEENTH CENTURY.—The development of important instrumental and vocal media and formal concepts through study of the music, the musicians and their environment. 3 s.h. (E) BRYAN

*164. MUSIC IN THE NINETEENTH CENTURY.—A study of the music of the nineteenth century, from Beethoven to Debussy, with attention to artistic and literary influences, and the relations among the creative minds of the time. Individual projects. 3 s.h. (E) MUELLER

*165. OPERA LITERATURE.—A study of opera from the Florentine Camerata to the present. The development of the operatic idea, with attention to changing relationships of music and text, to opera as social commentary, as well as to formal and stylistic means. Intensive study of complete scores of composers selected from Monteverde to Bartok; individual projects. 3 s.h. (E) SAVILLE

INDEPENDENT STUDY AND SENIOR SEMINAR

Admission to these courses will be subject to approval of the Director of Undergraduate Studies of the Department of Music and the individual instructor. The instructor as well as the course content will be established in accordance with the individual student's interests and capacities.

The Department offers work leading to graduation with distinction. See the section on Academic Honors on page 36.

191, 192. INDEPENDENT STUDY.—Directed reading and research and musical analysis within a prescribed area of musical literature. Open only to highly qualified students in the junior year, by permission of the department. See page 38. 6 s.h. (E) STAFF

193, 194. INDEPENDENT STUDY.—Same as 191, 192 but for seniors. See page 38. 6-12 s.h. (E) STAFF

195. CORRELATING INDEPENDENT STUDY.—Correlated study in the humanities, cultural epochs in European civilization or church history and liturgy is suggested. An extended paper is required. Intended primarily for senior music majors, but other qualified students may be admitted. 3 s.h. (E) KLENZ

197, 198. SENIOR SEMINAR IN MUSIC.—Offers guidance in the sources and materials of musical literature, and in the methods of stylistic analysis and criticism. A background of historical, stylistic, and theoretical knowledge is essential. Formal papers will be required. Open only to seniors, but not restricted to candidates for degree with distinction. 6 s.h. (E) STAFF

MUSIC EDUCATION

57-58. VOCAL DICTION.—Problems of diction as specifically applied to the art of singing. Required of all Applied Voice Majors. 2 s.h. (E) HANKS

106. PIANO METHODS AND MATERIALS.—A study of the materials and methods of piano pedagogy. The appropriate choice of essential and supplemen-

tary literature. Development of technique, style, and musicianship. Supervised practice teaching. Prerequisite: Music 47A, 48A, 97A, and 98A, or consent of the instructor. 3 s.h. (E) WITHERS

151. PUBLIC SCHOOL MUSIC EDUCATION.—Development of the child through music. Child voice and song literature; rhythmic activities; learning to listen; use of elementary instruments such as the autoharp, psaltery, bells, rhythm band instruments. Both group and individual help in elementary music theory; music reading exercises; chording and improvising piano accompaniments; conducting; construction of rhythm band scores. Integration of music with other activities, such as planning music for social studies units. 3 s.h. (E) MCCALL

152. PUBLIC SCHOOL MUSIC LITERATURE.—A study and analysis of key works in the symphonic, pianistic, and vocal repertoire which are particularly applicable to the teaching of music appreciation as a cultural aspect of social studies in the public school. 3 s.h. (E) MCCALL

153. VOCAL MUSIC IN THE PUBLIC SCHOOL.—Aims, repertoire, and techniques for teaching vocal music in the junior and senior high schools. Emphasis on organizations, administration, training, and performance of school choirs and ensembles; care of the changing voice. Planning a good music curriculum. 3 s.h. (E) SAVILLE

154. INSTRUMENTAL MUSIC IN THE PUBLIC SCHOOL.—Materials and methods of teaching instrumental music in the junior and senior high schools; emphasis on teaching technics, repertoire, organization, and administration of the instrumental curriculum. 3 s.h. (E) BONE

APPLIED MUSIC

The study of Applied Music concerns the understanding of music literature through performance. Instruction is offered in the following media: A. Piano; B. Strings; C. Woodwinds; D. Brass; E. Voice; F. Ensemble—Instrumental, Piano, Vocal coaching and performance; participation through one of the Departmental Ensembles listed at close of the Music section; G. Organ. Instruction in media A through E may be private or in classes limited to a minimum of 4 and a maximum of 7 students. Class instruction is restricted to the first 4 grades of proficiency. Class instruction shall be designated by adding the letter X to the appropriate medium and year-in-school classification. (Example: junior year, Woodwinds, class instruction is recorded 147CX.)

Students must contact the Music Department office so as to arrange an audition with the appropriate instructor *prior to registration in Applied Music courses.* The course numbers listed below refer to the student's class standing and not his musical proficiency.

47A, 48A; 97A, 98A; 147A, 148A; 197A, 198A. PIANO.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) WITHERS, FISHBAUGH AND PHELPS

47B, 48B; 97B, 98B; 147B, 148B; 197B, 198B. VIOLIN, VIOLA, 'CELLO.—For freshmen, sophomores, juniors, seniors 1 or 2 s.h. (E) CIOMPI AND KLENZ

47C, 48C; 97C, 98C; 147C, 148C; 197C, 198C. WOODWINDS.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) HENRY

47D, 48D; 97D, 98D; 147D, 148D; 197D, 198D. BRASS.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) BRYAN

47E, 48E; 97E, 98E; 147E, 148E; 197E, 198E. VOICE.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) HANKS AND CUSHMAN

47F, 48F; 97F, 98F; 147F, 148F; 197F, 198F. ENSEMBLE.—For freshmen, sophomores, juniors, seniors. 1 s.h. (E) STAFF

47G, 48G; 97G, 98G; 147G, 148G; 197G, 198G. ORGAN.—For freshmen, sophomores, juniors, seniors. 1 or 2 s.h. (E) HENDRIX

Credits: Credit for instruction in media A, B, C, D, E, and G is granted on the basis of 2 s.h. per semester for *one hour* of private instruction per week and a minimum of six hours practice weekly; or 1 s.h. per semester for *one-half hour* of private instruction, or one period of class study, and a minimum of six hours

practice per week. An additional weekly class meeting for performance and criticism may be required by the instructor without additional credit.

Credit for instruction in medium F is granted on the basis of 1 s.h. per semester for one rehearsal period of instruction and a minimum of three hours practice per week.

Music majors shall plan their Applied Music study so as to meet the following requirements of their chosen areas of concentration:

Majors in Music Theory or Music History and Literature should earn a minimum of 6 s.h. credit in Applied Music.

Majors in Applied Music must register for one hour of private instruction *per semester* and may earn a maximum of 18 s.h. credit in Applied Music.

Majors in Music Education who expect to teach music in the public schools should plan their Applied Music programs in consultation with the Director of Undergraduate Studies in Music. The credit hours in Applied Music required for certification in North Carolina may be earned through a program which includes the study of a major medium, a minor medium and participation in departmental organizations. (See p. 43 of this *Bulletin*).

Students other than music majors may receive not more than 8 s.h. credit for work in Applied Music. They may elect, after consultation with the Department either 1 hour (2 s.h. credit) or ½ hour (1 s.h. credit) of private instruction per semester. *No credit in Applied Music* will be allowed unless the student satisfactorily completes at some time before graduation six semester hours in Music Theory, or Music History and Literature.

FEES: Upper class students who have been accepted as music majors at the time of registration for applied music courses are exempt from paying the applied music fees. Other students are charged for all applied music media except "F" (Ensemble).

Fees are payable to the Treasurer's office of Duke University upon notification from that office at the beginning of each semester as follows:

One ½ hour private lesson per week for one semester	$45.00
Two ½ hour private lessons per week or one 1-hour private lesson per week for one semester	80.00
One 1-hour class lesson per week for one semester	20.00

All students registered for applied music instruction are charged for practice room facilities as follows:

Medium A. Piano Medium E. Voice Medium G. Organ	$15.00 per semester (room with piano or organ)
Medium B. Strings Medium C. Woodwinds Medium D. Brass	$10.00 per semester (room without piano)
Medium F. Ensemble	No practice room fee is charged

DEPARTMENTAL MAJOR

Prerequisites: Music 51-52 and 65-66.

Major Requirements: A minimum of 24 s.h. beyond the prerequisite courses. Initial work in the Department includes the following required courses:

Freshman Year:	Music 65-66
Sophomore Year:	Music 51-52, Music 115-116
Junior Year:	Music 147-148

During Orientation Week all prospective entering Freshman Music Majors are required to take: A. Piano proficiency exam., B. Theory proficiency exam., C. Audition in their major performance medium.

AREAS OF UPPERCLASS SPECIALIZATION

Concentration in one of four major areas in Music is possible in the Junior and Senior years. While the following outlines include more than the number of hours *required* for a major in music, they are strongly recommended by the Department as a basis for effective study.

Theory and Composition

Required:
Music 117-118, 122; Applied Music: 6 s.h.

Additional Departmental Recommendations:
Music Electives: 6 s.h.

History and Literature

Required:
2 Elective Courses in Music Literature; plus Music 197, 198;
Applied Music: 2 s.h.

Additional Departmental Recommendations:
Music Electives: 10 s.h., including a minimum of 4 s.h. in Applied Music.

Applied Music—A program of study designed for those students who intend to become performers and teachers of applied music.

Required:
Applied Music: 12 s.h.

Additional Departmental Recommendations:
Applied Music: 6 s.h.

Piano or Organ:
Music 135 or 149; 106 (Piano Majors only)

Voice:
Music 136; 57-58.

Other Media:
Study sequence to be worked out in consultation with the Director of Undergraduate Studies.

Music Education—A program of study designed for prospective teachers of High School Instrumental or Vocal Music. Details of this program are shown on page 43 of this *Bulletin*.

The music major must participate in one of the Departmental Ensembles or Organizations during *each* semester of undergraduate study.

DEPARTMENTAL ENSEMBLES

Brass Ensemble
Chamber Orchestra
Madrigal Singers
Piano Ensemble (may be in combination with Instruments or Voice)
String Ensemble (Sonata, Trio or Quartet)
Vocal Ensemble (Opera Workshop)
Woodwind Quintet

DEPARTMENTAL ORGANIZATION

Duke University Concert Band
Duke University Symphony Orchestra

NAVAL SCIENCE

PROFESSOR CALDWELL, CAPTAIN, U. S. NAVY, CHAIRMAN; ASSOCIATE PROFESSOR LE TOURNEAU, COMMANDER, U. S. NAVY, DIRECTOR UNDERGRADUATE STUDIES; ASSISTANT PROFESSORS: TWOMEY, MAJOR U. S. MARINE CORPS; GOBEN, LIEUTENANT COMMANDER, U. S. NAVY; STUTZ, LIEUTENANT, U. S. NAVY; CRACKNELL, LIEUTENANT, U. S. NAVY; JONES, LIEUTENANT, U. S. NAVY

Standardized titles and numbers for courses are established by the Bureau of Naval Personnel for use at the 52 NROTC institutions. The first digit indicates

the year of the course; the second digit (0) indicates that it is given on a semester basis; the third digit indicates the semester of the school year in which offered. Specialized courses for Marine Corps Officer candidates are indicated by the letter "M" after the number, and substitute for the basic course of the same number.

NS 101. NAVAL ORIENTATION.—History of navy regulations, naval customs and courtesies which are basic to further study of Naval Science. Introduction to carrier, air, surface, undersea, and amphibious warfare; basic types, characteristics, capabilities, and limitations of naval vessels; deck seamanship; naval formations and maneuvers. 3 s.h. (w) LE TOURNEAU AND CRACKNELL

NS 102. NAVAL HISTORY.—Naval history relating the rise and fall of sea power to other aspects of world history as a basis for understanding the role of navies in the world today. 3 s.h. (w) LE TOURNEAU AND CRACKNELL

91. INTRODUCTORY PSYCHOLOGY.—See page 115 of this *Bulletin* for course description. This is a University course required for all NROTC midshipmen.

NS 201. NAVAL WEAPONS.—A survey of the fundamentals of naval weapons and systems including the gun-weapon delivery problem, anti-submarine warfare, missiles, nuclear weapons, and space technology and their application to the control of the seas. 3 s.h. (w) JONES

NS 301. NAVIGATION.—Magnetic and gyro compasses; principles of chart construction; dead reckoning; piloting, nautical astronomy including a study of the actual and apparent motion of the earth, celestial coordinates, times systems, the astronomical triangle, identification of stars and planets; solutions of observations for lines of position; and work in practical navigation. 3 s.h. (w) STUTZ

NS 302. NAVAL OPERATIONS.—A survey of the components of general naval operations including concepts and application of relative motion, collision prevention, communications, weather, and the command and delegated functions involved in maneuvering single ships and multiship formations. 3 s.h. (w) STUTZ

NS 401. NAVAL ENGINEERING.—Principles of steam engineering as related to naval power plants for main propulsion and auxiliary machinery; principles of the marine nuclear engineering propulsion system; principles of ship stability and damage control; a general understanding of internal combustion engines. 3 s.h. (w) GOBEN

NS 402. PRINCIPLES AND PROBLEMS OF LEADERSHIP.—A study of the principles and problems of effective leadership with emphasis on the role of the military leader. Leadership precepts of personal example, sound management practice, and moral responsibility; human relations; discipline and administration of military justice are included. 3 s.h. (w) GOBEN

NS 301M. EVALUATION OF THE ART OF WAR.—A survey of the evolution of weapons, strategy, tactics and material; illustration of the classic principles of war by a study of selected battles and campaigns; a summary of the development of U. S. military and foreign policy. 3 s.h. (w) TWOMEY

NS 302M. MODERN BASIC STRATEGY AND TACTICS.—Modern tactical principles and techniques, especially on the small unit level, illustrated by contemporary historical examples; development of a general understanding of strategy. 3 s.h. (w) TWOMEY

NURSING

The nursing program is published separately in the *Bulletin of the School of Nursing*.

PHILOSOPHY

PROFESSOR BAYLIS, CHAIRMAN; ASSOCIATE PROFESSOR WILSON, DIRECTOR OF UNDERGRADUATE STUDIES; ASSISTANT PROFESSOR BINKLEY, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS CLARK, NEGLEY, PEACH, AND WELSH; ASSISTANT PROFESSOR SPECTOR

The undergraduate program in the Department of philosophy is designed to acquaint students with the content and the structure of philosophical theory in various areas. Discussion is encouraged so that the student can engage actively in the philosophical examination of problems.

Course offerings fall into two general categories: the systematic and the historical. In a systematic treatment, the organization of a course is primarily in terms of the problems presented by the subject-matter of that course, as in logic, ethics, metaphysics, etc. In historical courses, attention is directed more to the order of development in the thought of a particular philosopher (Plato, Aristotle, Kant, etc.), or in a historical period. In all courses, reading of the works of philosophers will acquaint the students with the important and influential contributions to the definition and solution of philosophical issues.

The problems raised in philosophy in respect to the various field of the arts and sciences involve questions which are not normally given attention in those particular disciplines. In the consideration of such problems, therefore, it is expected that the student will acquire some understanding and perspective of the major areas of man's intellectual endeavor. In this sense, philosophical comprehension is an essential part of a student's learning and education.

41, 42. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include, in Philosophy 41, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. In Philosophy 42 these include the nature and ground of values, ultimate goals, and moral obligation. (Philosophy 42 may be taken before, or with, Philosophy 41.) 6 s.h. STAFF

48. LOGIC.—A study of the conditions of effective thinking and clear communication. Examination of the basic principles of *deductive* reasoning. Open to freshmen and sophomores only. 3 s.h. BINKLEY, CLARK, AND WELSH

93, 94. HISTORY OF PHILOSOPHY: ANCIENT AND MODERN.—An introduction to philosophy through the study of some of the major writings of the ancient Greek philosophers (93) and modern philosophers through Kant (94). 6 s.h. (E) (Open to freshmen with a *B* average.) PEACH AND WILSON

101. PHILOSOPHY OF RELIGION.—A philosophical examination of selected concepts and doctrines of religion. 3 s.h. (E) BINKLEY

103. SYMBOLIC LOGIC.—Detailed analysis of deduction and of deductive systems. Open to sophomores only by permission of instructor. 3 s.h. (E) CLARK AND WILSON

104. PHILOSOPHY OF SCIENCE.—The principal philosophical and methodological problems in contemporary science. 3 s.h. (E) SPECTOR

107. POLITICAL AND SOCIAL PHILOSOPHY.—Discussion of the fundamental principles of political and social organizations, with particular attention to democratic philosophy, corporate theory, and Marxist-Soviet philosophy. 3 s.h. (W) NEGLEY

108. SOCIAL IDEALS AND UTOPIAS.—Reading of selected Utopias; analysis of the value-structures and political principles of these ideal societies. 3 s.h. (W) NEGLEY

109. PHILOSOPHY OF LANGUAGE.—A philosophical analysis of problems arising in the study of language and symbolism. Topics include: the nature of language, sign-using behavior, theories of meaning, types of discourse (scientific, mathematical, poetic), definition, ambiguity, metaphor. 3 s.h. (E) WELSH

110. EPISTEMOLOGY.—A treatment of the problems of truth and knowledge; of *a priori* and empirical statements; and of theories of perception and probability. 3 s.h. (E) BAYLIS, BINKLEY

111. METAPHYSICS.—A consideration of a selection from the following: Hegelian essentialism and existentialist reaction; traditional treatments of the mind-body problem: dualism, phenomenalism and materialism; rival theories of causation, space and time. 3 s.h. (E) BAYLIS, BINKLEY, AND WILSON

117. ANCIENT AND MODERN ETHICAL THEORIES.—The development of ethical thought in the West; the interaction between culture and ethical theory, with special reference to the Greek city-state, Roman law, the Renaissance, the Reformation, and the rise of modern science. Readings in the great ethical philosophers. 3 s.h. (E) WELSH

FOR SENIORS AND GRADUATES

202. AESTHETICS: THE PHILOSOPHY OF CRITICISM.—A study of some fundamental issues in aesthetics with particular reference to the fields of literature, music and painting. Problems discussed include the role of standards in criticism, aesthetic judgment, interpretation and evaluation in the arts, meaning in the arts, art and truth, the arts and morality. Open to juniors with the approval of the instructor. 3 s.h. WELSH

203. CONTEMPORARY ETHICAL THEORIES.—Study of the nature and justification of basic ethical concepts in the light of the chief ethical theories of twentieth century British and American philosophers. 3 s.h. BAYLIS AND BINKLEY

205. THE PHILOSOPHY OF HISTORY.—Discussion of the method, metaphysical implications, and influence of interpretations of history; Hegel, Marx, Spengler, Toynbee. 3 s.h. (W) NEGLEY

208. POLITICAL VALUES.—Analysis of the systematic justification of political principles and the political values in the administration of law. 3 s.h. (W) NEGLEY

211. PLATO.—A critical study of the dialogues with special emphasis on problems in ethics, epistemology, and metaphysics. 3 s.h. (E) BINKLEY

217. ARISTOTLE.—A study of parts of the *Organon, Physics, De Anima,* and *Metaphysics.* 3 s.h. (E) WILSON

219. KANT.—Reading and discussion of his philosophy, with some attention to historical continuity. 3 s.h. (W) NEGLEY

225. BRITISH EMPIRICISM.—A critical study of the writings of Locke, Berkeley, or Hume, with special emphasis on problems in the theory of knowledge. 3 s.h. (E) PEACH

227. CONTINENTAL RATIONALISM.—A critical study of the writings of Descartes, Spinoza, or Leibniz, with special emphasis on problems in the theory of knowledge and metaphysics. 3 s.h. (E) PEACH

228. RECENT AND CONTEMPORARY PHILOSOPHY.—A critical study of some contemporary movements in philosophy with special emphasis on the work of Moore, Russell, Wittgenstein, Wisdom, and Ryle. 3 s.h. (E) WELSH

229. AMERICAN PRAGMATISM.—Studies in the philosophy of Pierce, James, Dewey, and Mead. 3 s.h. (E) WELSH

233. INTRODUCTION TO THE PHILOSOPHY OF SCIENCE.—A systematic study of some central problems in the methodology of the sciences, e.g., the concept of a scientific explanation, theory and observation, and other topics. SPECTOR

234. PHILOSOPHY OF SCIENCE.—Selected problems in the physical and non-physical sciences. Topics such as space, time, measurement, probability and induction, and problems in the philosophy of the behavioral and social sciences. Prerequisite: Philosophy 233. SPECTOR

235. PHILOSOPHY AND THE SCIENCES.—An introduction to the philosophy of science with emphasis on the writings of philosophers and scientists in the history of science, such as Galileo, Newton, Mach, Poincare, and Einstein. (1964-65) SPECTOR

236. SPECIAL PROBLEMS IN THE PHILOSOPHY OF SCIENCE.—Selected topics concerning the methods of the sciences and the philosophy of science. (1964-65) Prerequisite: Previous work in the philosophy of science, or consent of the instructor. SPECTOR

The four courses above are given normally in a two year cycle.

241. LOGIC.—Fundamental problems of logic. 3 s.h. (E) CLARK AND WILSON

246. GENERAL SEMANTICS AND THEORY OF LANGUAGE.—An examination of semantical theory through Frege, Russell, Church, Tarski, Carnap, and Quine, together with a consideration of the implications of meaning theory for general philosophy. 3 s.h. (E) WILSON

250. PHILOSOPHICAL ANALYSIS.—A critical study of recent and contemporary essays in philosophical analysis, and an evaluation of the nature, methods, and results on this movement. 3 s.h. (E) BAYLIS, CLARK, AND WILSON

252. METAPHYSICS.—A critical and evaluative study of rival metaphysical theories and their bases. Analysis of the fundamental metaphysical categories and of metaphysical methods. 3 s.h. (E) BAYLIS, CLARK, AND WILSON

291, 292. CRITICAL PHILOSOPHY.—The analysis of basic philosophical concepts and beliefs with a view to critical evaluation and constructive emendation of them. Emphasis on the practice as well as the principles of philosophical criticism and problem solving. 3 s.h. each. Enrollment only by permission of the department. 291 is ordinarily prerequisite for 292. (E) THE GRADUATE STAFF

DEPARTMENTAL MAJOR

Philosophy 48 (Logic) is recommended for all those intending to major in philosophy. Philosophy 41, 42 is ordinarily a prerequisite to major work.

Major requirements: 24 semester hours in philosophy of which at least eighteen must be in courses numbered above 48. The following must be included:

Philosophy 93, and 94.
Philosophy 117, or 203, or 208.
6 semester hours in Philosophy senior-graduate courses.

Related Work: Six hours minimum in each of two departments approved by the philosophy adviser. Courses may not be those primarily open to freshmen. There is no restriction in principle as to departments in which related work may be taken, and the approval of the Philosophy adviser is required only to insure some coherence in the program of major and related work as a whole.

The Department offers work leading to graduation with distinction. See the section on Honors.

PHYSICS

PROFESSOR FAIRBANK, CHAIRMAN; PROFESSOR MEYER, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSOR CARPENTER, SUPERVISOR OF FRESHMAN INSTRUCTION; PROFESSORS BIEDENHARN, FOWLER, GORDY, GREULING, LEWIS, NEWSOM, NIELSEN AND SPONER; ASSOCIATE PROFESSOR ROBINSON; ASSISTANT PROFESSORS BILPUCH, EVANS, FORTNEY, MIYAQAWA, ONLEY, ROBERSON, TILLEY, AND WALTER; LECTURER BARTON; INSTRUCTORS GUYER, HUNT, RICHARDSON, AND WINNEWISSER

1-2. INTRODUCTORY PHYSICS.—This course traces historically and experimentally the development of the important principles of physics. This course is open to freshmen, sophomores and juniors and meets the general science requirement. Three lectures and one two-hour laboratory each week. 8 s.h. (W) CARPENTER, NIELSEN, BARTON, AND ASSISTANTS

41-42. GENERAL PHYSICS.—This course treats the basic principles of general physics in a more quantitative manner than Physics 1-2. It meets in a thorough way the physics requirement for entrance into the study of either medicine or engineering, and is well suited for the general science student. This course is not open for credit for students who have completed Physics 1-2. Three lecture-recitations and one three-hour laboratory period each week. Prerequisites: Mathematics 21, 22 or equivalent (Mathematics 21, 22 may be taken concurrently). 8 s.h. (W) CARPENTER, LEWIS, FAIRBANK, GREULING, ONLEY, FORTNEY, RICHARDSON, EVANS, WALTER, AND ASSISTANTS

125. INTERMEDIATE PHYSICS—MECHANICS.—The course covers in a thorough manner the elements of mechanics. Three recitations per week. Prerequi-

sites: Physics 1-2 or 41-42 or equivalent, and a course in differential and integral calculus. Mathematics 22 may be taken concurrently. 3 s.h. (w) TILLEY

126. INTERMEDIATE PHYSICS—ELECTRICITY.—The elements of electricity and magnetism. Three lectures and one three-hour laboratory per week. Prerequisites: Physics 125 or equivalent work approved by the instructor and differential and integral calculus. 4 s.h. (w) TILLEY

161, 162. MODERN PHYSICS.—Review of electromagnetic fields, relativity, quantum phenomena, atomic and molecular spectra, solids, and nuclear physics. Three lectures each week. Prerequisites: Physics 41-42, Mathematics 22. 161 is prerequisite for 162. 6 s.h. (w) ROBERSON

171. ELECTRONICS.—A.C. circuits, transients, fundamentals of vacuum tubes and electron physics, basic electronic circuits. Three lectures and one three-hour laboratory each week. Prerequisite: Physics 126 or equivalent work approved by the instructor. 4 s.h. (w) HUNT

176. INTERMEDIATE PHYSICS—THERMODYNAMICS AND KINETIC THEORY.—The elements of thermodynamics, kinetic theory and elementary statistical mechanics. Three lectures per week. Prerequisites: Physics 125 or equivalent work approved by the instructor, and differential and integral calculus. 3 s.h. (w) MEYER

A course in general college physics, Physics 125 and 126 or equivalent validated by examination, and a course in differential and integral calculus are prerequisites to all courses numbered 200 and above.

201, 202. MECHANICS.—The fundamental principles of Newtonian mechanics; general dynamics of systems of particles and rigid bodies; the methods of LaGrange and Hamilton; generalized mechanics. 6 s.h. GREULING

213, 214. CONTEMPORARY PHYSICS.—A course which covers the fundamental concepts and the experimental basis of modern physics. Three lectures each week. 6 s.h. (w) WALTER

217, 218. ADVANCED PHYSICS LABORATORY.—Measurements involving the fields of mechanics, electricity magnetism, heat, optics and modern physics. 6 s.h. (w) MEYER

220. ADVANCED ELECTRONICS.—Vacuum tubes and solid state devices, advanced circuit analysis. Three lectures and one three-hour laboratory each week. 4 s.h. (w) HUNT

221, 222. THEORETICAL PHYSICS.—Mechanics of particles and of rigid bodies, elasticity, fluids dynamics, electrodynamics; optic, relativity thermodynamics, statistical mechanics, wave mechanics. Prerequisite: Mathematics 285-286 or equivalent to be taken at least concurrently. 6 s.h. (w) WINNEWISSER

223. ELECTRICITY AND MAGNETISM.—Electrostatics, magnetostatics and potential theory; dielectric and magnetic media; magnetic field of currents and law of induction. 3 s.h. (w) ROBINSON

224. ELECTRICITY AND MAGNETISM.—Maxwell's electrodynamics, theory of wave optics, refraction, interference and diffraction. Prerequisite: Physics 223, 3 s.h. (w) ROBINSON

225, 226. ELEMENTARY INVESTIGATIONS.—The aim of this course is to provide training in the laboratory and library methods of physical research. Properly qualified students may conduct elementary investigations under the supervision of a member of the staff. 3-6 s.h. (w) THE STAFF

DEPARTMENTAL MAJOR

A student wishing to major in physics should arrange to complete the necessary mathematics as soon as possible.

A. for the A.B. degree:

Prerequisites: Physics 1-2 or 41-42 or equivalent, and Mathematics 21, 22.

Major Requirements: At least 18 semester hours in physics including Physics 125, 126, 171 and 176 or equivalent 217 or 218.

Related Work: Eighteen to 24 semester hours from the following courses:

Mathematics 21, 22, 63, 64 and 131, and Chemistry 1-2.
B. for the B.S. degree:

Prerequisites: Physics 1-2 or 41-42 or equivalent, and Mathematics 21, 22 or equivalent.

Major Requirements: Physics 125, 126, 171, and 176 or equivalent, 213, 214, 217, 218 and either 201 or 223.

Related Work: Fourteen to 24 semester hours from the following courses: Mathematics 21, 22, 63, 64 and 131, and Chemistry 1, 2 or 1 and 42.

The Department offers work leading to graduation with distinction. See the section on Honors.

POLITICAL SCIENCE

PROFESSOR HALLOWELL, CHAIRMAN; ASSOCIATE PROFESSOR HALL, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BALL, BRAIBANTI, COLE, CONNERY, KULSKI, RANKIN, AND WILSON; VISITING PROFESSOR KLINE; ASSOCIATE PROFESSORS LEACH, PROCTOR, SIMPSON AND SINDLER; VISITING ASSOCIATE PROFESSOR SAYEED; ASSISTANT PROFESSORS CHEEK, FINLAY, HOWARD AND KEARNEY; VISITING ASSISTANT PROFESSOR HULL; INSTRUCTOR ZIKMUND; MESSRS. MEEKISON AND WASHBURN

The objective of the Department of Political Science is to acquaint students with the theory and practice of government and politics at the local, state, national and international levels. While primary attention is focused upon the American political and administrative system, emphasis is also placed upon a comparative study of the political institutions and movements of thought peculiar to the nations of Europe, Latin America, Africa and Southern Asia. The student's attention is also directed to the problems encountered in international organization, politics and law. The development of political philosophy from Plato to the present day is an essential part of the department's course offerings. Methods of study include the descriptive, the historical, the legal, the comparative and the philosophical.

Directing its effort to an intelligent understanding of the contemporary world and of the responsibilities which are laid upon citizens of a democracy, the Department of Political Science shares the objectives of a liberal arts education. While the department does not aim at vocational education, the knowledge it seeks to impart should be useful to anyone contemplating a career in the government service or politics.

Students intending to major in the department should take Political Science 11-12 or 61-62. Ordinarily one of them must be taken before proceeding to more advanced work in the department. This rule may be waived with the consent of the Director of Undergraduate Studies.

The advanced courses are divided into three major groups but no sequence of courses beyond the introductory course is prescribed. The student would be well advised, however, to select some courses from each group.

The Senior Seminar is designed to provide an opportunity for majors in the department to pursue independent study and research, and to qualify for graduation with distinction.

INTRODUCTORY COURSES

11-12. AMERICAN AND EUROPEAN POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. An introductory course for freshmen dealing with the topics indicated in the description of Political Science 61-62. (Open only to Freshmen) 6 s.h. (E & W)

HALL; CHEEK AND FINLAY; MEEKISON AND ZIKMUND

61-62. AMERICAN AND EUROPEAN POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. The first semester is devoted to the study of American constitutional democracy. Topics examined include federal-state relations, the separation and interrelationships of the executive, legislative and judicial branches of government, judicial review, the role of political parties and public opinion, the formulation and execution of domestic and foreign

policy, civil liberties. The second semester is devoted to a study of constitutional democracy in Great Britain and France with emphasis upon the similarities and differences between those systems and our own. Detailed attention is also given to an examination of the theory and practice of totalitarian dictatorship as exemplified in the U.S.S.R. 6 s.h. (E & W) (Not open to Freshmen)
KLINE; LEACH AND SIMPSON; CHEEK AND KEARNEY; MEEKISON, WASHBURN AND ZIKMUND

POLITICAL THEORY AND COMPARATIVE GOVERNMENT

123. INTRODUCTION TO POLITICAL PHILOSOPHY.—A course devoted to the reading and discussion of selected political classics including Plato's *Republic,* Aristotle's *Ethics* and *Politics* and other works as time permits. 3 s.h. (W)
HALLOWELL

127. INTRODUCTION TO LAW.—An introduction to the nature and functions of law, with emphasis on the varied uses of law in ordering society, the process of legal growth and the nature of legal reasoning. Some attention will be given to basic issues of jurisprudence. 3 s.h. (W) Open only to Juniors and Seniors.
HOWARD

131. INTRODUCTION TO AMERICAN POLITICAL THOUGHT.—Basic elements in the American political tradition as developed from its English roots to the present. 3 s.h. (W) LEACH

136. MAJOR EUROPEAN GOVERNMENTS.—A general introductory survey of the governments of Great Britain, France, Germany, Italy, and the Soviet Union. Special attention is given to constitutional developments, the organization and ideologies of political parties, and current political problems. 3 s.h. (W) [Not open to students who have taken Political Science 12 or 62 but open to all others without prerequisite.] COLE

143. COMPARATIVE GOVERNMENT AND POLITICS: THE MIDDLE EAST.—Political institutions and behavior in the Arab states, Israel, Turkey and Iran. 3 s.h. (W) PROCTOR

151. COMPARATIVE GOVERNMENT AND POLITICS: LATIN AMERICA.—A study of politics and government in selected Latin American states, including Argentina, Brazil, Chile and Mexico. Political forces and their impact upon governmental institutions. 3 s.h. BALL

155. PROBLEMS OF POLITICAL DEVELOPMENT IN THE NEW STATES.—Survey of change and modernization in Africa and Asia; nationalism and neutralism, role of political parties, the military, and the bureaucracy in nation building; economic growth and foreign aid. 3 s.h. (W) BRAIBANTI; FINLAY AND KEARNEY

160. THE GOVERNMENT AND POLITICS OF THE U.S.S.R.—An analysis of the governmental institutions, party structure and policies of the Soviet Union. Attention will be given to policies affecting the intelligentsia, the workers and the peasants. 3 s.h. (W) KULSKI

180. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA I.—Concepts of political development in new states, using India, Pakistan, Ceylon and Malaya as case studies. Theory and practice of foreign aid and technical assistance as agents of political modernization. 3 s.h. (W) BRAIBANTI

181. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA II.—The political modernization of India and Pakistan since 1947. Constitutional developments as revealed in leading court judgments will be studied. Other topics will be the ideology of administrative reform, formulation of state polity, rural development and party politics. 3 s.h. (W) BRAIBANTI

182. COMPARATIVE GOVERNMENT AND POLITICS: JAPAN.—Although Chinese civilization will be studied as it relates to Japan, primary emphasis will be on the development of Japan's political system, starting with the Taikwa Reform and continuing to the present day. 3 s.h. (W) BRAIBANTI

183. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHEAST ASIA.—An analysis of the development of government in Thailand, Vietnam, Burma, Malaya, Indonesia and the Philippines. Attention will be given to the Islamic, Buddhist and other indigenous cultures of these nations. 3 s.h. (W) KEARNEY

223. POLITICAL PHILOSOPHY FROM PLATO TO MACHIAVELLI.—Intensive analysis of the political philosophies of Plato and Aristotle, a survey of medieval political thought and an analysis of the significance of Machiavelli. 3 s.h. (w) HALLOWELL

224. MODERN POLITICAL THEORY.—An historical survey and philosophical analysis of political theory from the beginning of the seventeenth to the middle of the nineteenth century. Attention is given to the rise of liberalism, the Age of Enlightenment, the romantic and conservative reaction, idealism and utilitarianism. 3 s.h. (w) HALLOWELL

225. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study of modern political institutions and processes, with particular attention to European constitutional government and politics. 3 s.h. (w) COLE

226. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study of modern political institutions and processes, with particular attention to European totalitarian and authoritarian political systems. 3 s.h. (w) COLE AND KULSKI

229. RECENT AND CONTEMPORARY POLITICAL THEORY.—The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Christianity and the social order. 3 s.h. (w) HALLOWELL

231. AMERICAN POLITICAL THEORY.—An analysis of the main currents in American political thought from colonial beginnings to the present day, with emphasis upon the development of liberalism in America. 3 s.h. (w) HALLOWELL

235. THE BRITISH COMMONWEALTH.—An analysis of the political relationships between the members of the Commonwealth and a comparative study of the political systems of the Commonwealth countries, with particular reference to Canada. 3 s.h. (w) COLE; HULL

250. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA I.—Methodology of comparative political analysis. Institutional, functional, problematic and culture-analytic approaches compared. Theoretical problems of induced political and administrative change using India and Pakistan as case studies. 3 s.h. (w) BRAIBANTI

251. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA II.—Political modernization of India and Pakistan emphasizing constitutional change, development of ideology, bureaucratic transition, party politics, law as an instrument of political change, and the community development movement. 3 s.h. (w) BRAIBANTI AND SAYEED

252. COMPARATIVE GOVERNMENT AND POLITICS: JAPAN.—A survey of the civilization of Japan, and an analysis of political development from the Taikwa Reforms to the modern period. 3 s.h. (w) BRAIBANTI

280. COMPARATIVE GOVERNMENT AND POLITICS: SUB-SAHARAN AFRICA.—Particular attention will be given to traditionalism and modernization, ideologies, leadership, party systems, the adaptation of parliamentary institutions, Africanization of the civil services, and the problem of political integration. 3 s.h. (w) PROCTOR

AMERICAN GOVERNMENT AND PUBLIC ADMINISTRATION

109. STATE AND LOCAL GOVERNMENT TODAY.—Problems in state, county and city government including the administration of government services such as education, public welfare, law enforcement; inter-governmental relationships; administrative reorganization; methods of popular control; and the reconstruction of state and local government so as to meet present-day needs. 3 s.h. (E) CHEEK

125. AMERICAN POLITICAL PARTIES AND PRACTICAL POLITICS.—A study of the historical development, organization, and methods of political parties in the United States. 3 s.h. (w) SIMPSON

128. THE JUDICIAL PROCESS.—The judicial process and the role of the judiciary in the development of public policy in the United States. 3 s.h. (w) Open only to Juniors and Seniors. HOWARD

129. GROUPS IN AMERICAN POLITICS.—A study of the composition, methods, and policies of organized groups as they participate in the creation of public opinion and in the formulation of public policy. Attention will be focused on recent national policy in the areas of agriculture, business, labor, education, welfare, foreign affairs, and on the roles that groups play in the formulation of these policies. 3 s.h. (w) SINDLER

137. POLITICAL BEHAVIOR IN ELECTIONS.—The behavioral approach will be used to examine decision-making in the political process. Attention will be focused on the major factors that affect the outcome of elections, such as the characteristics of the American voter, the conduct of campaigns, the influence of propaganda and public relations techniques, and the influence of campaign finance. 3 s.h. (w) SINDLER

138. POLITICAL BEHAVIOR IN POLICY MAKING.—A study of the major factors that come into play in the making of governmental policy decisions. Special attention will be paid to the role of pressure groups and the methods of their lobbyist representatives, to the effects of pressures from constituents, and to the pressures of the executive and legislative branches upon each other. 3 s.h. (w)

141. PUBLIC ADMINISTRATION.—An introduction to the role of administration in the governmental process considering principles of administrative organization, methods of administrative control, personnel and fiscal management. In general the study of the organizational and administrative problems encountered by any government agency charged with carrying out a public policy. 3 s.h. (w) HALL

142. ADMINISTRATIVE RESPONSIBILITY.—An evaluation of political, legal and administrative methods of achieving a responsible bureaucracy in American national government. Comparisons will be made with relevant experience and techniques in other countries such as Great Britain and France. 3 s.h. (w) HALL

146. LEGISLATION.—A study of the composition and structures of legislative bodies and of the legislative process with attention to procedure, methods, techniques, delegation of discretion, and the use of controls. 3 s.h. (w) SIMPSON

161. GOVERNMENT AND PLANNING.—A study of the planning functions at all levels of government in the United States. Particular attention will be devoted to the problems posed for planning by metropolitan growth. 3 s.h. (w) LEACH

164. GOVERNMENT REGULATORY POLICY AND ADMINISTRATION.—A consideration of selected regulatory policies of the American national government, such as anti-trust, transportation and communications, and of the administrative procedures and organizations designed to effect those policies. 3 s.h. (w) HALL

174. POLITICAL IMPLICATIONS OF ECONOMIC LEGISLATION.—A study of political and sectional alignments in the passage of tariff, farm, railway, New Deal and other economic legislation. 3 s.h. (w) SIMPSON

190. CAREER PROBLEMS IN GOVERNMENT.—Principles, techniques, and problems of public service; recent approaches to public personnel practices. 3 s.h. (w) CHEEK

207. AMERICAN CONSTITUTIONAL LAW AND THEORY.—A study of the leading principles of American government, as developed through judicial interpretation of the Constitution. 3 s.h. (w) RANKIN

208. AMERICAN CONSTITUTIONAL LAW AND CURRENT NATIONAL PROBLEMS.—A study of the influence of recent Supreme Court decisions upon the political and constitutional development of the United States. 3 s.h. (w) RANKIN

209. PROBLEMS IN STATE AND LOCAL GOVERNMENT IN THE UNITED STATES.—A study of the historical development of state and local governments, their present organization and subdivisions, and their relation to each other. Special attention is given to the position of the states in the federal union through the study of federal-state, inter-state, and state-local relations. 3 s.h. (w) RANKIN

230. AMERICAN POLITICAL INSTITUTIONS.—A study of the formation and development of institutions of the national government in the United States, with

historical and analytical treatment. Among other topics this course is concerned with the Constitutional Convention of 1787, and the development of Congress, the Presidency, and the Supreme Court. 3 s.h. (w) RANKIN

234. CIVIL-MILITARY RELATIONSHIPS IN AMERICAN GOVERNMENT.—A consideration of the role of the military in American government both in theory and in practice. Special emphasis will be given to formal civil-military structural arrangements for determining policies, such as the National Security Council, and to the degree of civilian control within the military establishment. 3 s.h. (w) CONNERY

241. ADMINISTRATIVE MANAGEMENT.—An advanced course in public administration with special attention being given to the development of scientific management, its application to government in the United States and a consideration of current problems in organization, procedures, work simplification, and management improvement. 3 s.h. (w) CONNERY

242. NATIONAL ADMINISTRATION.—A study of the administrative organization, working concepts and procedures of the United States Government, illustrated through the operations of the Bureau of the Budget. 3 s.h. (w) CONNERY

244. ADMINISTRATIVE LAW AND PROCESS.—The nature and law of the administrative process in the context of American government and politics, with special attention to the powers, procedures, and judicial control of administrative agencies. 3 s.h. (w) HALL

246. GOVERNMENT ADMINISTRATION AND PUBLIC POLICY.—Through use of the laboratory and case study techniques, a consideration of the types of administrative problems that the United States Government encounters in the field of public policy, and their possible solution. 3 s.h. (w) CONNERY

275. THE NATIONAL PARTY SYSTEM.—An intensive examination of selected facets of American national political parties, such as: relationships between presidential and congressional politics, the politics of national conventions, recent foreign policy and party alignments, and the controversy over party government. 3 s.h. (w) SINDLER

276. COMPARATIVE STATE PARTIES AND POLITICS.—A selective analysis of party patterns in the states, including such topics as: classification schemes for state party systems, the impact of various nominating procedures on party organization, relationships between national and state politics, and the influence of party system on the operation of state government, with special attention to the South. 3 s.h. (w) SINDLER

291. PROBLEMS OF URBAN GOVERNMENT.—Analysis of problems in the structure and functions of urban governments in the United States. 3 s.h. (w) RANKIN AND LEACH

292. URBAN ADMINISTRATION.—A study of principles and methods relating to municipal administration in the United States. 3 s.h. (w) RANKIN AND LEACH

INTERNATIONAL LAW AND RELATIONS

121. ELEMENTS OF INTERNATIONAL RELATIONS.—Analysis of international politics, of foundations of national power, and of international cooperation, with emphasis upon attempted solutions of the central problems of international security. 3 s.h. (E & W) KLINE; PROCTOR; FINLAY AND KEARNEY

122. MODERN INTERNATIONAL POLITICS.—An examination of the major problems of post-war international politics with particular attention to the extension of Soviet power, the Western response to this challenge, and the revolutions in the Afro-Asian world. 3 s.h. (E & W) KLINE AND PROCTOR

124. THE NEW STATES OF AFRICA IN WORLD AFFAIRS.—A study of the international political problems arising from the emergence of independent states in sub-Saharan Africa. 3 s.h. PROCTOR AND FINLAY

158. CONTROL OF AMERICAN FOREIGN POLICY.—A consideration of the forces which are responsible for the formulation of American foreign policy, and a study of the important factors which have influenced contemporary United States policy in the major areas of the world. The course includes an analysis of the

respective roles of the President, Congress, Department of State, and the United Nations, as well as military and public opinion. 3 s.h. (w) BALL

221. INTERNATIONAL PUBLIC ORGANIZATION.—A study of the structure and functioning of the United Nations organs, or related specialized agencies such as the International Labor Organization, and of regional agencies such as the Organization of American States and the North Atlantic Treaty Organization. 3 s.h. (w) WILSON

227-228. INTERNATIONAL LAW.—Elements of international law, particularly as interpreted and applied by the United States; rights and duties of states with respect to recognition, state territory and jurisdiction, nationality, diplomatic and consular relations, treaties, treatment of aliens, pacific settlement of disputes, international regulation of the use of force, and collective responsibility. 6 s.h. (w) WILSON

INDEPENDENT READING AND UNDERGRADUATE SEMINAR

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to qualified Juniors by permission of the Director of Undergraduate Studies and of the individual instructor. 3-6 s.h. STAFF

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to qualified Seniors by permission of the Director of Undergraduate Studies and of the individual instructor. 3-6 s.h. STAFF

197, 198. SENIOR SEMINAR IN POLITICAL SCIENCE.—A seminar concerned with the development of political science as a discipline, present frontiers of knowledge and research methods. A common problem will be explored and individual papers will be required on selected aspects of that problem. Required of all majors participating in the departmental honors program. Open only to Seniors. Prerequisite: Consent of the instructor. 6 s.h. (w) STAFF

DEPARTMENTAL MAJOR

Prerequisite: Science 11-12 or 61-62.

Major Requirements: Eighteen semester hours of work in the Department above courses 11-12 or 61-62, including at least nine semester hours of 200 courses.

Related Work: Six hours each in two departments approved by the Political Science adviser. Courses may not be those primarily open to freshmen. Usually related work is taken in the departments of history, economics, sociology or philosophy.

The Department offers work leading to graduation with distinction. See the section on Honors.

PORTUGUESE

For courses in Portuguese, see *Romance Languages.*

PSYCHOLOGY

PROFESSOR ALEXANDER, CHAIRMAN; PROFESSOR JONES, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS ADAMS, DAI, DIAMOND, GUTTMAN, KIMBLE; ASSOCIATE PROFESSORS BANHAM, BONEAU, BORSTELMANN, BREHM, CARSON, LAKIN, MCHUGH, WALLACH; RESEARCH ASSOCIATE PROFESSOR GAFFRON; ASSISTANT PROFESSORS ALTROCCHI, ERICKSON, GREENWOOD, KREMEN, SCHIFFMAN; LECTURERS COHEN, CROVITZ, EISDORFER, GEHMAN, KRUGMAN, OBRIST, PEELE, SCHMAVONIAN, SOMJEN, STEDMAN, THOMPSON; INSTRUCTOR HINMAN

Psychology 91 or its equivalent is a prerequisite for all other courses in psychology. Six semester hours in psychology (including Psychology 91) or special permission of the course instructor or the Director of Undergraduate Studies are required for admission to all psychology courses over 140.

91. INTRODUCTORY PSYCHOLOGY.—An introduction to the facts, principles, and problems of psychology through a study of motivation, emotions, perception, sensation, thinking, memory, learning, social behavior, individual differences, and personality. Offered both semesters. 3 s.h. (E & W) STAFF

100. PERSONALITY.—Representative theories of personality, from Freud to the present, emphasizing problems of normal personality structure, dynamics, development, and assessment. 3 s.h. ALEXANDER AND KREMEN

Not open to students who have had Psychology 116.

101. INTRODUCTORY SOCIAL PSYCHOLOGY.—Problems, concepts and methods in the study of social interaction and interpersonal influence. Topics include: Socialization; social factors in perception and learning; psychological principles underlying conformity; conditions affecting social interaction. 3 s.h. JONES AND BREHM

104. COMPARATIVE PSYCHOLOGY.—An examination of the bearing upon general psychological theory of experimental investigations of animal behavior in the fields of motivation and learning. 3 s.h. (w) ADAMS

110. APPLIED PSYCHOLOGY.—Applications of psychology to problems of personnel selection, industrial efficiency, advertising and selling, and other problems of practical interest. 3 s.h. (w) MCHUGH

111. ADVANCED GENERAL PSYCHOLOGY.—A more intensive study of several selected problem areas in the field of general psychology with special emphasis on experimental methods and findings in the areas considered. 3 s.h. (w) KIMBLE

116. PSYCHOLOGY OF ADJUSTMENT.—The course is planned to give an adequate understanding of problems of adjustment and mental hygiene. Lectures and discussions cover an application of the principles and findings of normal and abnormal psychology, as these relate to the adjustment of the average individual in our changing society. 3 s.h. (w) STAFF

Not open to students who have had Education 68 or Psychology 100. Open normally to nursing students and to others by permission of the instructor.

117. STATISTICAL METHODS IN PSYCHOLOGY.—Elementary statistical techniques and their application to the analysis and interpretation of psychological data. Theory of inference is stressed. 3 s.h. (w) BONEAU AND SCHIFFMAN

118. EXPERIMENTAL METHODS IN PSYCHOLOGY.—The procedures and methods of human and animal experimentation in such areas as learning, motivation, and perception. 3 s.h. (E) STAFF

121. CHILD PSYCHOLOGY.—A survey of theory and research on growth and behavior from infancy to adolescence, with special emphasis upon personality and cognitive development. 3 s.h. (w) BORSTELMANN AND MCHUGH

122. ADJUSTMENT OF THE PRE-SCHOOL CHILD.—Study and application of techniques of observing, recording and interpreting the behavior of the preschool child. The course is designed to meet the needs of students interested in the personality, development and social adjustment of children. One hour lecture and 4 hours laboratory. 3 s.h. (E) STAFF

126. ADOLESCENT PSYCHOLOGY.—The mental, social and emotional development of adolescence and youth will be studied with special attention given to such topics as interests, motivations, home problems, sex differences, recreation, delinquency, and development for citizenship. Prerequisite: Psychology 121 or Education 118, or permission of the instructor. 3 s.h. (w) MCHUGH

130. PRINCIPLES AND METHODS OF PSYCHOLOGICAL EVALUATION.—This is an introductory course in test methods used by psychologists in measuring and evaluating mental processes. The nature, purposes and utilization of various types of tests and psychological techniques will be discussed and demonstrated. Among the tests to be studied will be standard scales of intelligence; tests of special abilities, aptitudes, attitudes and interests; personality tests, rating scales and projective methods. Prerequisite: 6 s.h. in Psychology. 3 s.h. (w) BANHAM

132. THE PSYCHOLOGY OF INDIVIDUAL DIFFERENCES.—A study of the nature and causes of individual and group variations in intelligence, special abilities, social and emotional characteristics. These will be considered in relation to developmental sequence, aging factors, sex, race, biological inheritance, education and socio-economic conditions. Prerequisite: Psychology 130 or permission of instructor. 3 s.h. (w) BANHAM

141. PERSONALITY AND BEHAVIOR DISORDER.—Behavior disorder studied from the viewpoint of the psychological principles underlying the adjustment of the deviant personality. Prerequisite: Psychology 100. 3 s.h. (w)
ALTROCCHI, CARSON, AND LAKIN

142. INSTRUMENTAL BEHAVIOR.—A laboratory course using animal subjects in operant conditioning situations. Class members carry out a series of observations on conditioning, discrimination, motivation, and other basic phenomena. 3 s.h. (w) GUTTMAN

144. THE PSYCHOLOGY OF LEARNING.—A survey of the basic facts and principles of human and animal learning. Students in the course will perform an independent experiment. 3 s.h. (w) KIMBLE AND BONEAU

145. EXPERIMENTAL APPROACHES TO PERSONALITY.—Experimental methods applied to personality research with emphasis upon psychological studies in such areas as anxiety, conflict and frustration. Students will perform representative experiments. Prerequisite: Psychology 100 or permission of the instructor. 3 s.h. (w) WALLACH

147. EXPERIMENTAL SOCIAL PSYCHOLOGY.—Intensive consideration of selected problems in group dynamics, attitude change, and interpersonal perception. Current research and theory are stressed. Class members conduct individual research projects. Prerequisite: Psychology 101 or permission of the instructor. 3 s.h. (w) BREHM AND JONES

148. PSYCHOLOGY OF PERCEPTION AND THINKING.—A study of the basic phenomena of perception and thinking as determined by conditions in the external situation and in the person, biological and psychological. Students will perform representative experiments. 3 s.h. (w) CROVITZ

151. PSYCHOLOGY AND INTERNATIONAL RELATIONS.—This course will explore the application of psychological theories to problems of international relations including those concerned with inter-group conflict and its resolution, group identification and ethnocentrism, and the complexities of national character. The course will be problem oriented and conducted on a seminar basis. Theoretical papers and experimentation along the lines of topics mentioned above will be expected. Prerequisites: Psychology 91, 100 or 101, and consent of the instructor. (w) LAKIN

152. PHYSIOLOGICAL PSYCHOLOGY.—Neural bases of behavior, sensory and motor functions of the nervous system, and problems of emotion, motivation, and consciousness. Laboratory in psychophysics and the electrical activity of the nervous system. Prerequisites: Physics 1-2 or Chemistry 1-2 or permission of instructor. 3 s.h. (Formerly Psychology 112.) ERICKSON

153. INTRODUCTION TO BIOLOGICAL PSYCHOLOGY.—Application of biological principles to psychology. Among the concepts considered are species, gene, homeostasis, internal environment, reflex, synapse, organ, and receptor specificity. Phylogeny of the cortex treated in detail. Prerequisite: Zoology 1-2 and Comparative Anatomy, or permission of the instructor. 3 s.h. (Formerly Psychology 108) DIAMOND

171, 172. JUNIOR TUTORIAL.—Small group discussions of influential books and articles in psychology. Prerequisites: 6 s.h. in psychology and permission of Director of Undergraduate Studies. 4 s.h. BREHM AND STAFF

173, 174. SENIOR TUTORIAL.—Small group discussions of influential books and articles in psychology. Prerequisite: 12 s.h. in psychology and permission of Director of Undergraduate Studies. 4 s.h. BREHM AND STAFF

175, 176. INDEPENDENT RESEARCH.—Independent investigation of topics of special interest. Admission requires formulation of a study plan with a faculty supervisor and approval of the Director of Undergraduate Studies. Prerequisite: 9 s.h. of Psychology. 6-12 s.h. BREHM AND STAFF

191, 192. INDEPENDENT STUDY AND RESEARCH-I.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the department. See page 38. 6 s.h. BREHM AND STAFF

193, 194. INDEPENDENT STUDY AND RESEARCH–II.—Directed reading and research. Open only to highly qualified students in the senior year, by permission of the department. See page 38. 6-12 s.h. BREHM AND STAFF

The following courses are open to selected undergraduates with permission of the instructor:

203. PSYCHOLOGY OF PERCEPTION.—An examination of current systematic formulations with emphasis upon the intensive analysis of a variety of representative investigations. 3 s.h. STAFF

204. COMPARATIVE PSYCHOLOGY.—The study of behavior as related to species and of speciation as dependent upon behavior; instinct, imprinting and learning at different phylogenetic levels. 3 s.h. ADAMS

210. COGNITION AND HIGHER MENTAL PROCESSES.—An intensive analysis of the literature on thinking, problem solving, creativity, language, and related topics. Emphasis is upon the functional significance of these aspects of intellectual activity and upon the experimental methodology involved in their study. 3 s.h. BONEAU

213, 214. CONDITIONING AND LEARNING.—A survey of the literature on classical and instrumental conditioning and other forms of simple learning. Emphasis is on classical conditioning in 213 and on instrumental behavior in 214. 6 s.h. KIMBLE AND GUTTMAN

215. DEVELOPMENTAL PSYCHOLOGY.—A consideration of selected research areas in child behavior and development, including personality, cognition, perception and learning. Prerequisite: special permission of the instructor. 3 s.h. BORSTELMANN

216. BIOLOGICAL PSYCHOLOGY.—The methods of biology (as applied to psychology), especially in neurophysiology, neuroanatomy, and genetics. Topics covered include: (a) the genetics of behavior, (b) the organization of the dorsal thalamus and neocortex, (c) the limbic system and hypothalamus. Methods covered include: (a) ablation method, (b) method of evoked potential, (c) electrical stimulation of the brain, (d) classical and physiological genetics. 3 s.h. DIAMOND

217. RESEARCH METHODS IN SOCIAL PSYCHOLOGY.—Presents the theory and practice of data collection methods in social psychology. Emphasis is on the interplay between design and technique. The methods covered include formal scaling procedures, systematic observational techniques and others appropriate to field studies, field experiments, surveys and laboratory experiments. 3 s.h. BREHM

218. SOCIAL PSYCHOLOGY.—An examination of selected problem areas in social psychology including social factors in cognition, models of social interaction, conformity and social influence, and attitude development and change. Recent research is emphasized in relation to its historical context and its bearing on the development of theory. 3 s.h. JONES

220. PHYSIOLOGICAL BASES OF BEHAVIOR.—Classical studies on the neuropsychology of learning and behaviors such as hunger, thirst and sex. The central role of neuroendocrinology in the physiological bases of motivated behavior. 3 s.h. STAFF

225. PERSONALITY AND EXPERIMENTAL DYNAMICS.—Application of experimental methods to the study of psychodynamics, personality development and behavior pathology. Stress is on research in early experience and its influence on personality, frustration, conflict, anxiety, and the mechanisms of defense and adaptation. 3 s.h. STAFF

234. SEMINAR IN PERSONALITY.—Selected research topics of current interest in experimental study of personality, including risk-taking, creativity, and cognitive styles. 3 s.h. WALLACH

237. FUNCTIONAL NEUROPHYSIOLOGY.—Considers the mechanisms of activity of the individual neuron and groups of nerve cells, the principles of activity of the afferent and efferent neural systems, and the integrative and associative functions of the nervous systems. Laboratory demonstrations and participation. Permission of the instructor. 3 s.h. ERICKSON

238. THE ELECTROENCEPHALOGRAM AND PSYCHOLOGICAL FUNCTION.—A survey of experimental and clinical literature on brain wave correlates of intelligence, personality, behavior disorders, epilepsy, sleep, sensory stimulation, reaction time, and attention. Special emphasis is placed on the electrophysiology of conditioning and learning. Lectures, laboratory demonstrations and clinical case presentations. 3 s.h. OBRIST

239. BEHAVIORAL CORRELATES OF BRAIN DAMAGE IN MAN.—Effects of brain damage on psychological functioning. Known brain-behavior relationships and problems encountered in the study of brain function. Laboratory demonstrations for assessment of cerebral dysfunction through the use of standard psychological tests. 3 s.h. THOMPSON

245, 246. PERSONALITY THEORY AND ASSESSMENT.—An examination of representative models of human functioning from Freud to the present day. Included are examples from psychoanalytical, field theoretical and behavioristic approaches. Laboratory sessions will be concerned with personality assessment of normal human subjects over time. Interview and testing procedures will be introduced and the data gathered assessed against the theoretical models studied. 6 s.h. ALEXANDER AND KREMEN

265. FUNDAMENTAL STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—Introduction to probability and the use of statistics in description and hypothesis testing in psychology including the following applications: correlational techniques, chi-square and t tests, distribution-free tests and one-way analysis of variance. Prerequisite: Psychology 117-118 or equivalent. 3 s.h. BONEAU

266. ADVANCED STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—The basic theory and application of analysis of variance techniques to complex experimental designs will be covered. Additional advanced techniques, including factor analysis, will be introduced. Prerequisite: Psychology 265 or equivalent. 3 s.h. BONEAU

292. HISTORY OF PSYCHOLOGY.—The history of psychology, particularly in the experimental period of the past century and of its involvement in biology since Darwin. 3 s.h. ADAMS

DEPARTMENTAL MAJOR

Prerequisite: Psychology 91 or equivalent.

Major Requirements: 24 semester hours in psychology, including Psychology 91, 117, and a minimum of two courses numbered above 140.

Related Work: 18 semester hours which may include certain courses in chemistry, economics, education, English, linguistics, mathematics, philosophy, physics, political science, sociology-anthropology and zoology.

RELIGION

PROFESSOR PRICE, CHAIRMAN; ASSISTANT PROFESSOR WHITE, DIRECTOR OF UNDERGRADUATE STUDIES; ASSOCIATE PROFESSOR OSBORN, SUPERVISOR OF FRESHMAN INSTRUCTION; ASSOCIATE PROFESSORS BRADLEY, JONES, PHILLIPS, POTEAT, AND SULLIVAN; ASSISTANT PROFESSORS DANIELS, LANGFORD, MCCOLLOUGH, AND WINTERMUTE; VISITING ASSISTANT PROFESSORS LOWRIE AND SHRIVER; DR. CRESSON; MESSRS. CROSSLEY AND LORD

The purpose of the undergraduate program of instruction in religion is to make the students aware of the influence of religion in the history of mankind and in the contemporary world, and to help him appreciate its significance in his own experience. Attention is centered on the Bible, the history and thought of Christianity, and the development of other religious traditions. In addition to the basic courses designed to fulfill the University requirement in religion, advanced courses are offered to meet the needs of specially interested students. In every case the student is encouraged to consider carefully his own religious convictions, to the end that he may reach a more intelligent understanding of his rôle in the world and of his relation to God.

Students who have fulfilled the uniform course requirement in religion are eligible to elect any course numbered 100 or above, except those for which additional prerequisites are prescribed. Courses numbered below 100 may not be taken by those who have completed the uniform course requirements in religion.

1-2. THE ENGLISH BIBLE.—A comprehensive survey of the books of the Old and New Testaments. The literature is examined in the light of its origin in the history and religion of the people of the Bible, in order that its theological significance in its own day and in ours may be understood. Open only to freshmen. 6 s.h. STAFF

51-52. THE ENGLISH BIBLE.—A survey of the Old and New Testaments, similar to Religion 1-2 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion 1-2. 6 s.h. STAFF

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 3 s.h. STAFF

65. JESUS: THE MAN AND HIS MESSAGE.—A detailed examination of the Gospel records, for the purpose of recovering the person and mission of Jesus. Attention will be given to conceptions of Christ in the history of the Church, and to his contemporary significance. Prerequisite: Religion 55. Not open to students who have completed the uniform course requirements in religion. See Religion 121. 3 s.h. PHILLIPS

85. INTRODUCTION TO CHRISTIAN ETHICS.—An analysis of the Biblical and theological bases for an understanding of man's moral situation, with a study of the social implications of Christianity in selected problem areas. Prerequisite: Religion 55. Not open to students who have completed the uniform course requirements in religion. See Religion 152. 3 s.h. MCCOLLOUGH

93. SURVEY OF THE WORLD'S LIVING RELIGIONS.—An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, the world's living religions are dealt with in terms of historical development and the beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55. Not open to students who have completed the uniform course requirements in religion. See Religion 175. 3 s.h. BRADLEY AND SULLIVAN

100. PRINCIPLES OF INVESTIGATION.—An introduction to the resources and methods appropriate to advanced study in Religion. Required of all majors; open to others. 1 s.h. JONES AND WHITE

111. THE PROPHETS OF THE OLD TESTAMENT.—A study of the origin and rise of the prophetic movements, the message of the prophets in their historical setting, the contributions of this movement to the Biblical view of God and history, and the significance of the prophets for today. 3 s.h. WINTERMUTE

121. THE MISSION AND MESSAGE OF JESUS.—An analysis and interpretation of the Gospels, designed to afford the student a fuller understanding of Jesus and his mission. Not open to students who have received credit for Religion 65. 3 s.h. DANIELS AND PRICE

123. THE LIFE AND LETTERS OF PAUL.—A study of the available sources for the life of Paul, his rôle in the expansion of the Christian movement, the most important aspects of his thought, and his continuing influence. 3 s.h. DANIELS

131. HISTORY OF CHRISTIANITY FROM THE EARLY CHURCH THROUGH THE REFORMATION.—A study of events, trends, personalities, and interpretations that have shaped Christianity from the time of the early Church through the sixteenth century, intended to acquaint the student with the Christian heritage and to contribute to his understanding of contemporary Christianity. 3 s.h.

133. HISTORY OF CHRISTIANITY SINCE THE REFORMATION.—A study of events, trends, personalities, and interpretations which have shaped Christianity

since the Reformation, with emphasis upon those which contribute to an understanding of the contemporary religious situation. 3 s.h.

137. PROTESTANTISM IN AMERICA.—A study of representative men, movements, and thought in American Protestantism to 1918. 3 s.h. JONES

138. CONTEMPORARY RELIGIONS IN THE UNITED STATES.—Judaism, Catholicism, and Protestantism are studied with reference to their distinctive beliefs and practices. A comparison is made of common and dissimilar features. 3 s.h. PHILLIPS

140. CHRISTIAN BELIEFS.—An introductory study of important Christian teachings concerning God, Jesus Christ, sin and salvation, etc., intended to serve as a basis for the student's evaluation of his own religious concepts. 3 s.h. LANGFORD AND MCCOLLOUGH

144. PROBLEMS OF RELIGIOUS THOUGHT.—A study of the relation of belief in God to various other types of knowledge and experience, such as the research of natural and social scientists and the facts of suffering, human tragedy, and evil. 3 s.h. LANGFORD AND POTEAT

149. CURRENT INTERPRETATIONS OF CHRISTIANITY.—Contemporary types of Christian thought as seen through the writings of such leading representatives as Karl Barth, John Baillie, Paul Tillich, and Reinhold Niebuhr. 3 s.h. OSBORN

152. CHRISTIAN ETHICS.—A systematic study of the ethical implications of Biblical religion. Attention is given both to the historical development of the Christian ethic and to the responsibility of the Christian in the various aspects of contemporary social life, such as marriage, the state, race, etc. Not open to students who have received credit for Religion 85. 3 s.h. MCCOLLOUGH

156. CHRISTIAN MARRIAGE AND THE FAMILY.—Marriage and the family in American society studied from the Christian perspective. Attention will be given to the teachings of the churches and of psychologists and sociologists concerning courtship and marriage, sex, parent-child relationships, mixed marriages, and divorce. 3 s.h. PHILLIPS

160. CHRISTIAN EDUCATION.—A study of the educational work of the Church, with emphasis upon the philosophy, objectives and functions of Christian education. 3 s.h. DANIELS

171. RELIGIONS OF THE ANCIENT NEAR EAST.—The history and literature of religions in the cultures of Egypt, Mesopotamia, Persia, and Palestine from earliest times to 600 B.C. 3 s.h. WINTERMUTE

172. RELIGIOUS QUESTS OF THE GRECO-ROMAN WORLD.—The religious movements in the Hellenistic age, including sectarian Judaism, Persian dualism, the mystery cults, and Gnosticism. 3 s.h. WINTERMUTE

175. NON-CHRISTIAN RELIGIONS OF THE MODERN WORLD.—An examination of the beliefs of Islam and the religions of India, China, and Japan. Emphasis will be placed upon the sacred literature, world view, history, and cultural and social significance of the principal non-Christian religions. Not open to students who have received credit for Religion 93. 3 s.h. BRADLEY AND SULLIVAN

176. WORLD RELIGIONS AND SOCIAL CHANGE.—Religious traditions and institutions in national and international affairs. Intensive study of selected areas of Asia and Africa with special stress on missionary religions and political change. 3 s.h. BRADLEY

178. MYTH AND SYMBOL.—Historical and phenomenological study of religious myth and symbol, Christian and non-Christian. The nature and function of myth in religion; types of myths, with particular attention to cosmogonic myths. The nature of religious symbols; structural and comparative study of selected symbols. 3 s.h. PARTIN

179. MYSTICISM: SACRED AND PROFANE.—Varieties of mystical experience, both religious and non-religious; representative mystics in Hinduism, Islam, Chris-

tianity, and Mahayana Buddhism; the nature and significance of mysticism within these traditions. Prerequisite: Religion 93 or 175. 3 s.h. SULLIVAN

187. RELIGIOUS VALUES IN CLASSICAL AND EUROPEAN LITERATURE.—A consideration of the religious insights, explicit and implied, in representative writings. 3 s.h. WHITE

189. MAN IN MODERN PROPHETIC THOUGHT.—The individual and society in the writings of Kierkegaard, Nietzsche, and Berdyaev. 3 s.h. MCCOLLOUGH

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the junior year, by permission of the department. 6 s.h. See page 38.

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students in the senior year, by permission of the department. 6-12 s.h. See page 38.

195-196. HONORS RESEARCH.—The first semester is a seminar in which methods of research are applied to selected problems in religion; in the second semester, independent research projects are reported to the class, and eventuate in research papers. Normally taken in the junior year. 6 s.h. Staff

Senior Seminars. The following seminars parallel the five categories of courses offered in the department. They afford opportunities for more intensive reading and individual research. Each major must take one of these courses in his senior year; they are open also to qualified non-majors. To be eligible for a seminar the student (major or non-major) must have completed at least one course in this area or pass the qualifying examination on the departmental reading list in that category. Each seminar will be offered as frequently as student demand and available personnel permit.

203. BIBLICAL STUDIES.—3 s.h.

204. CHURCH HISTORY.—3 s.h.

205. THEOLOGY AND ETHICS.—3 s.h.

206. CHRISTIANITY AND CULTURE.—3 s.h.

207. HISTORY OF RELIGIONS.—3 s.h.

210. CONTEMPORARY BRITISH THEOLOGY.—Selected problems in representative British theological writings after 1920. Prerequisite: permission of the instructor. 3 s.h. LANGFORD

228. THE THEOLOGY OF THE GOSPEL AND THE EPISTLES OF JOHN.—A study of the origin of these writings, the provenance of their thought forms and symbolism, their influence on the early Church, and their contemporary significance. Prerequisite: permission of the instructor. 3 s.h. PRICE

248. THE THEOLOGY OF KARL BARTH.—An historical and critical study of the theology of Karl Barth. Prerequisite: permission of the instructor. 3 s.h. OSBORN

279. RELIGIONS OF EAST ASIA.—Major traditions of China and Japan with emphasis upon the development and expansion of Buddhism. Prerequisite: permission of the instructor. 3 s.h. SULLIVAN

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the main sources and traditions of the classical civilization of the Indian subcontinent with particular attention to religious movements and institutions. (Also listed as History 285.) Prerequisite: permission of the instructor. 3 s.h. SULLIVAN

DEPARTMENTAL MAJOR

Prerequisite: Completion of the uniform course requirement in religion. (The sequence Religion 1-2 or 51-52 is recommended.)

Major Requirements: Twenty-five semester hours selected as follows:

A. Religion 100 (to be taken in the semester after becoming a major).

B. Three hours from each of the following categories: (A major may fulfil, without credit, the requirement in any one of these areas by passing the departmental examination on the basic book list for that category).

1. Biblical studies: 111, 121, 123, 228

2. Church history: 131, 133, 137, 138
3. Theology and ethics: 140, 149, 152, 156, 189, 210, 248
4. Christianity and culture: 144, 187
5. History of religions: 17, 172, 175, 176, 178, 179, 279

C. A three hour senior seminar in one of the five categories.

D. At least six hours elected from the departmental curriculum.

Related Work: Eighteen semester hours, including a minimum of six hours in each of two departments. There is no restriction in principle as to departments in which related work may be taken. The departmental major adviser will take into consideration the vocational objective of the student and the need to select courses which will strengthen his major work.

The Department offers work leading to graduation with distinction which is normally begun in the junior year. See the section on graduation with distinction in this *Bulletin*.

ROMANCE LANGUAGES

PROFESSOR FEIN, CHAIRMAN; PROFESSOR DOW, DIRECTOR OF UNDERGRADUATE STUDIES IN FRENCH; PROFESSOR DAVIS, DIRECTOR OF UNDERGRADUATE STUDIES IN SPANISH; ASSOCIATE PROFESSOR CORDLE, SUPERVISOR OF FRESHMAN INSTRUCTION IN FRENCH; ASSOCIATE PROFESSOR TORRE, SUPERVISOR OF FRESHMAN INSTRUCTION IN SPANISH; PROFESSORS CASTELLANO, CHERPACK, FOWLIE, PREDMORE, AND WARDROPPER; VISITING PROFESSOR WILLIAMSON; ASSOCIATE PROFESSORS GRANT AND VINCENT; ASSISTANT PROFESSORS BARLOW, BUSH, CASTELLANO, DOW, FLINT, HULL, MILLER, RIPLEY, TER HORST, TÉTEL, AND WALKER; INSTRUCTORS BRYAN, DANIEL, AND PERRY; FLINT, GOODE, GRANT, JENNY, MORGANROTH, SIEBER, SUSSKIND, AND UPCHURCH

French 63-64 and Spanish 63-64 are the prerequisites for all elective courses. Students who, by reason of foreign residence, have had special opportunities in French or Spanish must be classified by the Director of Undergraduate Studies.

FRENCH

1-2. ELEMENTARY FRENCH.—Introduction to understanding, speaking, reading, and writing French. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (E & W)
HULL AND STAFF

63-64. INTERMEDIATE FRENCH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: French 1-2 or two years of high-school French. 8 s.h. (E & W)
VINCENT AND STAFF

91, 92. INTRODUCTION TO FRENCH LITERATURE.—An introduction to the major writers of the French literary tradition. Selections and complete works of poetry, fiction, theater, and essay. In the first semester: Middle Ages through the 18th century. In the second semester: 19th and 20th centuries. Lectures and discussions; short essays and tests. Conducted in French. Prerequisite: French 63-64 or equivalent. 6 s.h. (E & W) CORDLE AND STAFF

97. SPOKEN FRENCH.—Intensive instruction in the spoken language: contemporary French prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: French 64. 3 s.h. (E) BRYAN, DOW, AND BUSH

104. THE SIXTEENTH CENTURY.—An introduction to the spirit of the French Renaissance as reflected in the literature of the age of Rabelais and Montaigne, Ronsard and Du Bellay. 3 s.h. (E) VINCENT

106. THE WORLDS OF ROUSSEAU.—Studies of Rousseau's conception of the real world (the *Discours*), the ideal world (*Émile and the Contrat Social*), the fictional world (*La Nouvelle Héloïse*), and his personal world (the *Confessions* and the *Rêveries*). 3 s.h. (E) CHERPACK

107. THE WORLDS OF VOLTAIRE.—Studies of Voltaire's conception of the real world (historical, philosophical, and satirical writings), his aesthetic world (poetry, drama, criticism), and his personal world (correspondence). 3 s.h. (E) CHERPACK

108. FRENCH ROMANTICISM.—The beginnings of the modern era, in its quest for new values and a new expression, as studied through the great lyric poets and prosodists of the first half of the nineteenth century. Readings from Chateaubriand, Lamartine, Musset, Hugo, Vigny and others. 3 s.h. (E) GRANT AND RIPLEY

109. TOWARD MODERNISM IN FRENCH POETRY.—An introduction to modern trends in the nineteenth century: emergence from traditional Romanticism; Art for Art's Sake and the Parnassians (Gautier, Leconte de Lisle); the transition from Decadence to Symbolism (Baudelaire, Verlaine, Rimbaud, and Mallarmé). 3 s.h. (E) BARLOW

111. FRENCH DRAMA OF THE NINETEENTH CENTURY.—A survey of the French theatre from the Romantic period to the *Théâtre libre*. 3 s.h. (E) DOW

112. FRENCH DRAMA OF THE TWENTIETH CENTURY.—Reading of representative plays selected from the works of Bernstein, Maeterlinck, Romains, Sarment, Vildrac, J.-J. Bernard, Claudel, Lenormand, Pagnol, Giraudoux, Anouilh, and others. 3 s.h. (E) DOW

113. THE CLASSICAL IDEAL.—The cultural hegemony of France in seventeenth century Europe. The classical masterpieces as the rational focus of her vigorous thought and art. Descartes, Pascal, Corneille, Racine, Molière, and others. 3 s.h. (E) WALKER

127, 128. ADVANCED COMPOSITION AND CONVERSATION.—During the first semester elements of syntax are briefly reviewed, along with constant drill in the conversational idiom. In the second semester, there are exercises in free composition with intensified treatment of pronunciation and diction. Prerequisite: 97 or consent of instructor. 6 s.h. (E) MRS. DOW, TÉTEL, AND VINCENT

130. TWENTIETH-CENTURY FRENCH POETRY.—In the wake of symbolism: Valéry and Claudel; poetry as ritual: Péguy, Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John Perse. 3 s.h. (W) FOWLIE

134. CONTEMPORARY FRENCH LIFE AND THOUGHT.—An introduction to the essential currents in French thought since 1895. Representative literary works are used as a basis for analysis and discussion of the contemporary scene. 3 s.h. (W) CORDLE AND BUSH

181-182. INTRODUCTION TO FRENCH.—Intensive introduction to the language. Modern readings. Open only to students in the Honors-Masters program who have completed the second college year of another foreign language. 6 s.h. (E)

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified juniors by permission of the Department. See page 38. 6 s.h.

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified seniors by permission of the Department. See page 38. 6 -12 s.h.

209. ADVANCED COMPOSITION AND SYNTAX.—A detailed study of the morphological and syntactic structure of the French language; practice in writing various styles of French; vocabulary study. 3 s.h. (W) HULL

210. FRENCH PHONETICS.—The phonemic structure of contemporary French. Sounds, intonation. Practice in transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied to French. 3 s.h. (W) HULL

213. FRENCH CLASSICISM.—Its initial phase. Readings from Malherbe, Balzac, Voiture, Descartes, Corneille, Molière, and others. 3 s.h. (W) CHERPACK

214. FRENCH CLASSICISM.—Its maturity. Readings from Pascal, Racine, La Fontaine, La Rochefoucauld, Boileau, Bossuet, Madame de Sévigné, La Bruyère, Saint-Simon, and others. 3 s.h. (W) CHERPACK

217. MALLARMÉ AND RIMBAUD.—The symbolism and the formal elements of Mallarmé's poetry. The poetic theory and the psychic elements in Rimbaud's poetry. 3 s.h. FOWLIE

219. OLD FRENCH LITERATURE.—An introduction to the reading of medieval French literary texts. 3 s.h. (w) VINCENT

221. THE NINETEENTH CENTURY FRENCH NOVEL.—The initial phase. The Romantic hero in conflict with society, with special emphasis on the works of Stendhal and Balzac. 3 s.h. (w) GRANT

222. THE NINETEENTH CENTURY FRENCH NOVEL.—A continuation of 221. The decline of the individual hero. Flaubert and Zola will receive intensive study. 3 s.h. (w) GRANT

223. FRENCH LITERARY CRITICISM.—A history of critical theory in France and a study of the major critics from the Renaissance to today. 3 s.h. FOWLIE

225, 226. FROM RENAISSANCE TO BAROQUE IN FRENCH LITERATURE OF THE SIXTEENTH CENTURY.—First semester: literary prose. Readings from Jean Lemaire de Belges, Marguerite de Navarre, Rabelais, Montaigne, and others. Second semester: poetry and theater. Readings from Marot, Scève, Labé, Saint Gelais, the Pléiade, d'Aubigné, Sponde, Du Bartas, Garnier, and others. 6 s.h. (w) TÉTEL

228. FRENCH POETRY OF THE TWENTIETH CENTURY.—In the wake of symbolism: Valéry and Claudel; poetry as ritual: Péguy; Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John Perse. 3 s.h. FOWLIE

233. CONTEMPORARY FRENCH THEATRE.—A study of dramatic theory; the art of the leading directors; and the major texts of Claudel, Giraudoux, Anouilh, Sartre, Beckett, Ionesco, Genet, etc. 3 s.h. FOWLIE

234. PROUST.—A study of *A la recherche du temps perdu*. The thematic structure and the aesthetics of the work. 3 s.h. FOWLIE

236. BAUDELAIRE.—A study of the poetry and criticism of Baudelaire as contributing to the origins of modern art and literature. 3 s.h. (w) FOWLIE

241, 242. FRENCH LITERATURE AND THOUGHT IN THE AGE OF ENLIGHTENMENT.—First semester: The new philosophy and its propagation. Lectures and discussions involving texts by Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and others. Second semester: the crisis in literary aesthetics. Readings, lectures, and discussions bearing on the clash between Classicism and new literary orientations. 6 s.h. (w) CHERPACK

245. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—The metamorphoses of Symbolism. A study of the work of Proust, Gide, and Claudel. 3 s.h. (w) CORDLE

246. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—The Existentialist conversion. A study of the work of Malraux, Sartre, and Camus. Extensive readings from the varied works of the three writers. 3 s.h. (w) CORDLE

248. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—Three Modern Prophets. Extensive readings from Bloy, Bernanos, Péguy. 3 s.h. (E) BUSH

ITALIAN

181-182. ITALIAN.—Intensive introduction to the language. Modern readings. Completion of the second college year of another foreign language will normally be required as a prerequisite. 6 s.h. (E) TÉTEL

283. DANTE: LA DIVINA COMMEDIA.—Explication of the poem with particular attention to literary structure. Reading in Italian or English. 3 s.h. (w) WILLIAMSON

288. THE RENAISSANCE.—Petrarch, Boccaccio and Ariosto. 3 s.h. (w) TÉTEL

PORTUGUESE

181-182. PORTUGUESE.—Intensive introduction to the language. Modern readings. Completion of the second year of another foreign language will normally be required as a prerequisite. 6 s.h. (w) MILLER

SPANISH

1-2. ELEMENTARY SPANISH.—Introduction to understanding, speaking, reading, and writing Spanish. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (E & W)
MILLER AND STAFF

63-64. INTERMEDIATE SPANISH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: Spanish 1-2 or two years of high-school Spanish. 8 s.h. (E & W)
FLINT AND STAFF

91, 92. INTRODUCTION TO SPANISH LITERATURE.—An introduction to the major writers of the Spanish literary tradition. Selections and complete works of poetry, fiction, theater, and essay. In the first semester: Middle Ages through the 18th centuries. In the second semester: 19th and 20th centuries. Lectures and discussions; short essays and tests. Conducted in Spanish. Prerequisite: Spanish 63-64 or equivalent. 6 s.h.
DAVIS AND STAFF

97. SPOKEN SPANISH.—Intensive instruction in the spoken language: contemporary Spanish prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: Spanish 64. 3 s.h. (E)
PREDMORE, FLINT, MILLER, AND TORRE

156. REPRESENTATIVE WRITERS OF SPANISH AMERICAN LITERATURE.—Study of works which are examples of the principal literary currents after 1880. 3 s.h. (W)
FEIN

161. SPANISH LITERATURE OF THE RENAISSANCE AND THE BAROQUE.—A study of selected works of the sixteenth and seventeenth centuries with attention to their reflection of social, religious, and political ideas. 3 s.h. (E)
MILLER AND TER HORST

162. SPANISH ROMANTICISM.—A study of the romantic spirit in modern Spanish literature. 3 s.h. (E)
TORRE

163. THE GENERATION OF 1898.—A study of the "Spirit of 1898" with special emphasis on the novel and essay. The precursors: "Clarín" and Ganivet; Unamuno, Baroja, "Azorín," Valle-Inclán; influence on the next generation: Pérez de Ayala and Ortega y Gasset. 3 s.h. (E)
FLINT

164. SPANISH CIVILIZATION.—This course is designed to develop an understanding of the Spanish cultural heritage through the study of selected historical, literary and artistic materials. 3 s.h. (E)
FLINT

165. ANALYSIS OF GREAT SPANISH AUTHORS.—A close textual study of a few literary texts with some considerations of methods of literary criticism. The course is designed to give the student insight into various ways of interpreting and understanding literary works so that his experience of literature in general may be enriched. 3 s.h. (E)
WARDROPPER

176. ADVANCED CONVERSATION.—This course is designed to develop facility of expression through constant drill on vocabulary and conversational idiom. Time will be devoted to a review of the essentials of Spanish syntax. Prerequisite: Spanish 97 or permission of the instructor. 3 s.h. (E)
CASTELLANO

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified juniors by permission of the Department. See page 38. 6 s.h.

193, 194. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified seniors by permission of the Department. See page 38. 6-12 s.h.

251. THE ORIGINS OF THE SPANISH NOVEL.—A critical study, based on close readings and discussions, of selected examples of the principal genres of the early novel: *Amadis de Gaula,* Diego de San Pedro's *La cárcel de amor,* the *Abencerraje,* the *Lazarillo,* Montemayor's *Diana.* 3 s.h. (W)
WARDROPPER

252. SPANISH LYRIC POETRY BEFORE 1700.—A critical study, based on close reading and discussion, of selected poems of the Middle Ages, Renaissance and Baroque. Special emphasis on the *Razón de amor, la poesía de tipo tradicional,*

and Santillana; on Garcilaso, San Juan de la Cruz, Fray Luis de León, and Herrera; on Góngora and Quevedo. 3 s.h. (w) WARDROPPER

253. THE ORIGINS OF THE SPANISH THEATER.—A study of the evolution of the Spanish theater from the *Auto de los Reyes Magos* (12th century) through the end of the 16th century. The idea of the theater as dramatic poetry will be stressed; close reading of texts by Gómez Manrique, Encina, Gil Vicente, Torres, Naharro, Lope de Rueda, Juan de la Cueva. 3 s.h. (w) WARDROPPER

255. MODERN LATIN AMERICAN LITERATURE.—The coming of age of Latin American literature in the nineteenth and twentieth centuries, with particular attention to the Modernist movement. 3 s.h. (w) FEIN

256. CONTEMPORARY LATIN AMERICAN LITERATURE.—Trends in Latin American literature after the Modernist movement. Analysis of significant works in various genres. 3 s.h. (w) FEIN

258. OLD SPANISH LITERATURE.—An introduction to the reading of medieval Spanish literary texts. 3 s.h. (w) DAVIS

259. SPANISH PHONETICS.—A phonemic approach to the study of Spanish sounds. Remedial pronunciation drills with special emphasis on rhythm and intonation. Readings in current studies of phonology. Prerequisite: Spanish 176 or permission. 3 s.h. (E) CASTELLANO

260. ADVANCED COMPOSITION AND SYNTAX.—Study of fundamental difficulties in the language; practice in writing idiomatic Spanish; exercises in free composition. For students who have a satisfactory command of Spanish grammar and fair conversational ability. Prerequisites: Spanish 176 or permission. 3 s.h. (E) CASTELLANO

261. NINETEENTH CENTURY NOVEL.—A study of literary and social trends in the last half of the nineteenth century. Readings will be selected from the novels of Valera, Pereda, Galdós, Pardo, Bazán, Blasco Ibáñez, and their contemporaries. 3 s.h. (w) DAVIS

264. MODERN AND CONTEMPORARY SPANISH THEATRE.—A brief review of the modern and contemporary Spanish theatre from the period of Romanticism. Lectures, reading, and discussion of the most representative works of Benavente, Martínez Sierra, los hermanos Quintero, etc. 3 s.h. (E) CASTELLANO

265. GOLDEN AGE LITERATURE: CERVANTES.—The life and thought of Cervantes with special emphasis on his *Quijote*. 3 s.h. (w) PREDMORE

266. GOLDEN AGE LITERATURE: THE DRAMA.—A study of the chief Spanish dramatists of the seventeenth century with readings of representative plays of this period. 3 s.h. (w) CASTELLANO

275. CONTEMPORARY SPANISH LITERATURE: ESSAY AND LYRIC POETRY.—A study of the revision of national values and literary expression in the twentieth century with particular reference to the crisis of 1898 and to the enrichment of the Spanish tradition through extrapeninsular influences. 3 s.h. (w) PREDMORE

276. CONTEMPORARY SPANISH LITERATURE: NOVEL.—A study of tradition and innovation in the twentieth century Spanish novel with emphasis on the novels of Unamuno, Baroja, Valle Inclán, and Pérez de Ayala. 3 s.h. (w) PREDMORE

ROMANCE LANGUAGES

RL 211. APPROACHES TO ROMANCE LITERATURE.—An introduction to the most significant ways in which Romance Literature has been divided and studied, with analyses of selected texts. 3 s.h. (w) CHERPACK

RL 218. THE TEACHING OF ROMANCE LANGUAGES.—Evaluation of objectives and methods; a study of the practical problems involved in teaching these languages on the elementary, secondary, and college level; analysis of textbooks, special foreign language programs, audio-visual aids; critical examination of modern techniques in written and oral testing. 3 s.h. (E) DOW

RL 224. ROMANCE LINGUISTICS.—The origin and development of the Ro-

mance languages from spoken Latin to the modern standard languages and local dialects. Introduction to the structural method as applied to historical and comparative linguistics. Prerequisite: French 219, Spanish 258, or permission of instructor. 3 s.h. (w) HULL

DEPARTMENTAL MAJOR

Prerequisites: French or Spanish: 63-64 or equivalent.
Major Requirements: For French:

1) 97
2) 127 or 128
3) 209 or 210
4) A minimum of 15 hours of courses in literature (91 and above) including six hours above 200. All majors must take one of the following: 113, 213, 214.

For Spanish:
1) 97
2) 176
3) 259 or 260
4) A minimum of 15 hours of courses in literature (91 and above) including six hours above 200. All majors must take one of the following: 161, 251, 252, 253, 265, 266.

The Department offers work in the junior and senior years leading to graduation with distinction. See the section on Honors in this *Bulletin*.

RELATED WORK

Majors in Romance Languages will select, with approval of the Director of Undergraduate Studies, appropriate courses from the following fields: (1) other languages and literature; (2) history: (3) philosophy; (4) appreciation courses in music and art; (5) linguistics; and occasionally from other fields deemed suitable.

RUSSIAN

ASSOCIATE PROFESSOR JEZIERSKI; ASSISTANT PROFESSORS M. PAVLOV, H. PAVLOV, MR. DUDA; SWAN AND MISS SALVÉ

1-2. ELEMENTARY RUSSIAN.—Introduction to understanding, speaking, reading and writing. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 8 s.h. (w) STAFF

63-64. INTERMEDIATE RUSSIAN.—Intensive classroom and laboratory practice in spoken and written patterns. Reading in contemporary literature. Prerequisite: Russian 1-2, or two years of high school Russian. 8 s.h. STAFF

91-92. ADVANCED RUSSIAN.—Systematic study of syntax and style in the written and spoken language. Readings of nineteenth and twentieth century authors. Oral and written reports. Conducted in Russian. Prerequisite: Russian 63-64, or equivalent. 6 s.h. (w) PAVLOV

97, 98. SPOKEN RUSSIAN.—Intensive instruction in the spoken language: contemporary Russian prose provides the basis for vocabulary building, and for practice in structural patterns. Does not satisfy the minimum uniform requirement. Limited to 15 students. Prerequisite: Russian 92. 3 s.h. M. PAVLOV

101, 102. RUSSIAN LITERATURE AND CULTURE THROUGH THE NINETEENTH CENTURY.—Russian prose, poetry and criticism, with special attention to recent periods. Readings (from *The Igor Tale* to Blok) in English. Lectures and class discussion. 6 s.h. (w) JEZIERSKI

103. SOVIET LITERATURE AND CULTURE.—Literature since 1917, as a continuation of nineteenth-century traditions and as a response to Soviet ideology. Readings (in English or Russian) from major works of prose, poetry and drama. 3 s.h. (w) JEZIERSKI

105. THE RUSSIAN THEATRE AND DRAMA.—Russian drama from its beginnings to contemporary practice. Lectures, class, discussions, readings of plays (Pushkin to Majakovskij) in English or Russian. 3 s.h. (w) JEZIERSKI

112. PUSHKIN AND THE BIRTH OF RUSSIAN REALISM.—An intensive study of the works of Russia's greatest poet. Readings in English or Russian. Prerequisite: Russian 101 or instructor's consent. 3 s.h. (w)

191, 192. INDEPENDENT STUDY.—Directed reading and research. Open only to highly qualified students by permission of the department. (See page 38.) 6 s.h.

201, 202. THE NOVELISTS OF NINETEENTH CENTURY RUSSIA.—Development of the Russian novel against the European background, with emphasis on Dostoevskij and Tolstoj. Extensive readings in English or Russian. Lectures, oral reports, class discussions and term paper. 6 s.h. (w) Jezierski

DEPARTMENTAL MAJOR

Prerequisite: Russian 1-2

Major Requirements: Russian 63-64 and 18 semester hours in the department including 91-92 and at least 6 semester hours of senior-graduate courses.

Related Work: 18 semester hours chosen with the approval of the department from the humanities, history and the social sciences.

SOCIOLOGY AND ANTHROPOLOGY

PROFESSOR MCKINNEY, CHAIRMAN; ASSOCIATE PROFESSOR ROY, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BACK, KERCKHOFF, LABARRE, MADDOX, AND THOMPSON; ASSOCIATE PROFESSORS MCCORMACK, PREISS, ROWE, SMITH, AND TIRYAKIAN; ASSISTANT PROFESSORS FARLEY AND WINSBOROUGH

Sociology 91 or 92, or the equivalent or special permission of the instructor or of the Director of Undergraduate Studies, is a prerequisite for all courses at the 100 and 200 levels, except 131, 132, 133, 230, 232, 234, and 236.

91. INTRODUCTION TO SOCIOLOGY: CONCEPTS AND PROCEDURES.—Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. 3 s.h. (E & W) Open to Freshmen. Staff

92. INTRODUCTION TO SOCIOLOGY: SOCIOLOGICAL STUDIES.—Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 3 s.h. Open to Freshmen. (E & W) Staff

93. GENERAL ANTHROPOLOGY.—Origins and distribution of mankind; a survey of human palaeontology and human biology, world archaeology, prehistory and languages; and the origins of the family, primitive economics, arts, social and political organization. Special attention is given to primitive people. 3 s.h. (w) Staff

94. CULTURAL ANTHROPOLOGY.—A study of the dynamics of culture, the causal factors, functions, integration and disintegration, diffusion, growth and change of cultures. Emphasis is upon the simpler societies. 3 s.h. (w) Staff

130. CULTURAL CHANGE AND STABILITY.—Contemporary theories of culture change, especially those resulting from acculturation and from implementation of programs of technical and economic aid; a consideration of the factors significant in maintaining stability or stimulating change in traditional cultures. 3 s.h. (w) Rowe

131. PEOPLES OF THE WORLD: AMERICAN INDIAN.—A comprehensive survey of the Indians of North and South America, including a study of origins and prehistory, archaeology, physical anthropology, languages, material culture, social and political organization, economics and religion, discussed in terms of the "culture area" concept. 3 s.h. (w) LaBarre

132. PEOPLES OF THE WORLD: AFRICA AND OCEANIA.—A comprehensive survey of the non-European peoples of Africa and Oceania, covering available prehistory, archaeology, racial affiliations, languages, material culture, social and political organization, economics and religion, discussed in terms of the "culture area" concept. 3 s.h. (w) LaBarre

133. PEOPLES OF THE WORLD: ASIA.—A comprehensive survey focusing on the peoples and societies of South, Southeast and East Asia, including the pre-

historic, ethnic, linguistic, religious and political foundations of the complex civilizations; the response of traditional Indian, Chinese and Japanese cultures to the West. 3 s.h. (w) McCORMICK AND ROWE

137. COMPARATIVE SOCIAL STRUCTURES.—Social anthropological analysis of role structures and corporate groups in particular societies, and their relevance for understanding the historic process of civilization. Case study of social types and of the unique features of societies revealed by the comparative method. 3 s.h. (w) McCORMACK

141. INTRODUCTION TO POPULATION AND HUMAN ECOLOGY.—This course provides an introduction to two macroscopic aspects of society. Both the size, distribution and composition of populations, and the morphological aspects of collective life are considered. 3 s.h. (w) WINSBOROUGH AND FARLEY

142. THE SOCIOLOGY OF MASS COMMUNICATION.—An analysis of the role of radio, the press, magazines, movies and television in modern societies. An examination of the selective audiences, content characteristics, controlling elements, and organizational structure of the various media of mass communication. 3 s.h. (w) SMITH

145. URBAN SOCIOLOGY.—Using historical, demographic, and ecological materials for background, urban society is studied with respect to its institutions, interactional patterns, differentiation, integration, disorganization, and decentralization. 3 s.h. (w) SMITH AND FARLEY

146. INDUSTRY AND SOCIETY.—A study of industrial institutions in their interrelationships with other forms of social behavior in the broad cultural setting of western civilization. Attention will center upon analysis of specific social problems resulting from the impact of industrial change. 3 s.h. (w) ROY

150. THE FAMILY.—Analysis of the American family as an institutionalized group and its relationship with other institutions and structural features such as social class and ethnic group. Special attention is devoted to methods of research in this area. 3 s.h. (w) KERCKHOFF

153. SOCIOLOGY OF THE SOUTH.—The developing regional organization of the world economy studied with especial reference to Southern life. A survey of the composition and distribution of population, races and race relations. Primary emphasis is upon social change. 3 s.h. (w) THOMPSON

154. THE SOCIOLOGY OF THE ARTS.—An analysis of the social relations of the world of the arts (painting and sculpture, music, and literature) with emphasis upon creative artists, art publics, art organizations and art works as they function in their social-cultural milieux. 3 s.h. (w) STAFF

155. INTRODUCTION TO INDUSTRIAL SOCIOLOGY.—An analysis and appraisal of the various factors that affect human relations in industry. The interpersonal and intergroup relationships within the individual industrial unit which determine its efficiency as an economic and social institution and the social conditions in the community as they affect social relations. 3 s.h. (w) ROY

159. THE NEGRO IN AMERICA.—A study of the history and changing status of the Negro regarded as a symbol and protagonist of minority groups in America and elsewhere. 3 s.h. (w) THOMPSON

172. COLLECTIVE BEHAVIOR AND SOCIAL MOVEMENTS.—Examination of disruptive and relatively unorganized aspects of social phenomena such as crowd behavior, fads, rumors, crazes and social movements as indexes of social disequilibrium and potential sources of social change. 3 s.h. (w) KERCKHOFF

199. INDEPENDENT STUDY.—Directed reading and research. Required of candidates for graduation with distinction in the department. Open only to highly qualified students in the senior year, by permission of the department. 3 s.h. (w) STAFF

230. SOCIETY AND CULTURE IN INDIA.—The basic features of Indian cultures and societies from an anthropological perspective. The impact of selected technological and social changes upon the individual, caste, and community. 3 s.h. (w) ROWE AND McCORMACK

232. PRIMITIVE RELIGION.—The ethnography, the social functions, and the sociopsychological meanings of religion in primitive societies. 3 s.h. (w) LaBarre

234. PERSONALITY AND SOCIETY.—The sociology and social psychology of human personality, its origins in the primary group, its nature and varieties and its integrations into secondary group institutions. 3 s.h. (w) LaBarre

236. PERSONALITY AND CULTURE.—The influence of culture patterns and social institutions upon character structure, socialization of the individual, and the dynamics of human personality. Comparative anthropological materials will be drawn upon. Prerequisite: Course 234. 3 s.h. (w) LaBarre

238. LANGUAGE AND SOCIETY.—Universal features of language; language as a mirror of society and social perception through language; language as a coding system; linguistics and anthropology; applied linguistics. 3 s.h. (w) McCormack

241. SOCIAL STRATIFICATION.—The nature of hierarchical and vertical differentiation in the economic, political, and prestige structures in modern societies. The interrelationship of class, status, and power strata and their influence on social institutions, personality structure, and group and individual behavior. 3 s.h. (w) Roy

242. THE SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS.—The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 3 s.h. (w) McKinney

245. DEVIANT SOCIAL BEHAVIOR.—Analysis of deviant behavioral systems (illness, crime, delinquency, etc.) in terms of a) precipitating social factors, b) patterns and goals, c) remedial and counter-acting controls. 3 s.h. (w) Preiss

247. COMMUNITY AND SOCIETY.—This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, and news, mass behavior, social problems, races, and classes. 3 s.h. (w) Thompson

253. SOCIAL INSTITUTIONS.—The study of particular institutions and the social movements out of which they developed, with emphasis on the development of general propositions concerning the nature, function, and importance of institutions in society. 3 s.h. (w) Thompson

255. RACE AND CULTURE.—A comparative study of race relations in world perspective developed around such themes as race and personal identity, the geography and ecology of race relations, the idea of race, and race conflict. 3 s.h. (w) Thompson

272. THE SOCIALIZATION PROCESS.—Universal societal requirement for continual replacement of socialized personnel. Variations in socialization by position in the social structure (class, caste, urban-rural, etc.) and contribution made by various socialization agencies (family, school, peer groups, mass media). Western society is focus of study. 3 s.h. (w) Kerckhoff

275. SOCIAL ATTITUDES AND INDIVIDUAL BEHAVIOR.—The importance of symbolic interaction, the development of the "self," individual movement within the social structure, and the importance of membership groups and reference groups. 3 s.h. (w) Kerckhoff and Back

278. SOCIAL STRUCTURE AND THE LIFE CYCLE.—A study of the relationship between age as a social characteristic and social interaction, with particular reference to adolescence and old age. 3 s.h. (w) Maddox

281. DEVELOPMENT OF SOCIOLOGICAL THEORY.—An analysis of the development, convergence, and utilization of sociological theory. Prerequisite: 15 s.h. credit in sociology. 3 s.h. (w) McKinney, Tiryakian and Preiss

295. METHODOLOGY IN SOCIOLOGY.—Considerations of the nature of scientific method, as well as alternative paths to knowledge, as they apply to sociology. Conceptualization, hypothesis formation, and definition. The research process as a decision-making situation both on the general level of research design and the specific level of special techniques. The process and logic of data analysis. Relations of theory and research are stressed. 3 units. Smith and Back

297. STATISTICAL ANALYSIS IN SOCIOLOGY.—Such techniques as zero and higher order linear and curvilinear correlation, partial correlation, analysis of variance, and covariance and factorial design are studied. When possible, analogous non-parametric techniques are also considered. Undergraduates must have at least 15 s.h. and a B average in sociology and obtain the permission of the instructor. 3 s.h. (w) WINSBOROUGH AND FARLEY

DEPARTMENTAL MAJOR

Senior-Graduate courses.

Major Requirements: Twenty-four semester hours of work in the Department including either or both Sociology 91 and 92 and at least six semester hours in the Senior-Graduate courses.

Related Work: A minimum of eighteen semester hours, at least twelve of which are normally chosen from two of the following fields: economics, education, history, political science, and psychology. Additional courses in other fields may also be elected as related work when indicated by the educational requirements of the student and approved by the Departmental adviser.

SPANISH

For courses in Spanish, see *Romance Languages*, p. 128.

UNIVERSITY COURSES

FALL SEMESTER

199.1 THE IMPACT ON OUR SOCIETY AND CULTURE OF MODERN SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT.—PAUL M. GROSS

199.2 THE ARTS AT MID-CENTURY.—IAIN HAMILTON

199.3 PHILOSOPHY OF RESEARCH IN THE BIOLOGICAL SCIENCES.—DAVID T. SMITH

199.4 THE EUROPEAN THEATRE OF THE RENAISSANCE AND THE BAROQUE.—BRUCE W. WARDROPPER

SPRING SEMESTER

199.5 AMERICA IN PERSPECTIVE.—JOHN R. ALDEN

199.6 LEGAL REASONING.—BRAINARD CURRIE

199.7 THE MAJOR QUESTIONS OF BIOCHEMISTRY.—PHILIP HANDLER

ZOOLOGY

PROFESSOR HORN, CHAIRMAN; ASSOCIATE PROFESSOR BAILEY, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BOOKHOUT, GRAY, GREGG, MENZIES, SCHMIDT-NIELSEN, WILBUR; VISITING PROFESSOR HUGHES-SCHRADER; ADJUNCT PROFESSOR STEFÁNSSON; ASSOCIATE PROFESSORS FLUKE, HUNTER, KLOPFER, LIVINGSTONE, VERNBERG, WAINWRIGHT, AND WARD; ASSISTANT PROFESSORS COSTLOW, COURTENAY, AND TUCKER; INSTRUCTORS ANDERSON, BEATTY, AND STRUHSAKER

1. ANIMAL BIOLOGY.—The principles of biology as applied to animals. 4 s.h. (E & W) KLOPFER AND STAFF

2. GENERAL ZOOLOGY.—A survey of the animal kingdom. Prerequisite: Zoology 1. 4 s.h. (E & W) BOOKHOUT, MRS. HUNTER, AND STAFF

53. COMPARATIVE VERTEBRATE ANATOMY.—A study of the anatomy and evolution of the organ systems of vertebrates. Prerequisites: Zoology 1, 2. 4 s.h. (W) HORN AND STAFF

71. HEREDITY AND EUGENICS.—Effects of environment and heredity upon the individual and populations: interpretation of human genetic histories. Prerequisite: one year of zoology. 3 s.h. (W) WARD

92. GENERAL EMBRYOLOGY.—An introduction to the study of developmental processes. Prerequisite: Zoology 1, 2. Recommended Zoology 53. 4 s.h. (w)
GREGG AND STAFF

103. PRINCIPLES OF ECOLOGY.—An introduction to the study of organisms in natural habitats, with particular attention to the growth of animal populations, the chemical role of organisms, energy flow through food chains, and the development of ecological systems through geologic time. Prerequisites: Botany 1, 2 or Zoology 1, 2; Mathematics 17 or 21. 4 s.h. (w) LIVINGSTONE

109. EVOLUTION.—Analysis of the processes of adaptation and evolution in individuals, populations, and genetic systems. Lectures and student reports. Prerequisite: Genetics or consent of the instructor. 3 s.h. (w) KLOPFER

110. INTRODUCTION TO GENETICS.—The principles and practical application of genetics. Prerequisite: one year of zoology or consent of instructor. 3 s.h. With laboratory—4 s.h. (w) WARD

120. ORNITHOLOGY.—Lectures, laboratory and field trips dealing with the classification, adaptations, and natural history of birds. Prerequisite: one year of zoology. Zoology 53 recommended. 4 s.h. (w) BAILEY

146. PHYSICAL BIOLOGY.—Physical principles of structure and function in large biological molecules and aggregates, applications to heredity, to function at higher levels of organization, and to biological fitness and accommodation. Prerequisites: Mathematics 22, Chemistry 151, and Physics 41 (or equivalents), one and one-half years of college biology, or consent of the instructors. 4 s.h. (w)
FLUKE AND WAINWRIGHT

148. ELEMENTARY BIOCHEMISTRY.—The chemistry of proteins, lipids, carbohydrates and nucleic acids and the metabolic interrelationships of these compounds. Subjects of special interest to biologists, including photosynthesis, chemical genetics, vision, nutrition and the chemical basis of muscle and nerve function. Prerequisites: Chemistry 151, one year of college physics (second semester may be concurrent), Mathematics 22, or consent of the instructor. 3 s.h. (w)
R. HILL, FRIDOVICH AND STAFF

151. PRINCIPLES OF PHYSIOLOGY.—An introductory survey of physiological functions. Prerequisites: At least a year of zoology and a year of chemistry. 4 s.h. (w) TUCKER

156. VERTEBRATE HISTOLOGY.—The microscopic structure of normal tissues and organs of the vertebrate body. Training will be given in the preparation of material for microscopic study. Prerequisite: Open only to juniors and seniors who have completed two years of zoology. 4 s.h. (w)

161. ANIMAL PARASITES.—An introductory course dealing with biological principles involved in parasitism of animals including man. Prerequisite: one year of zoology. 4 s.h. (w) MRS. HUNTER

196. SEMINAR.—Open to junior and senior departmental majors. 2 s.h. (w)
STAFF

197, 198. SPECIAL PROBLEMS.—Senior and Junior majors who have had proper training may be permitted to carry on special work. Permission must be obtained from the Director of Undergraduate Studies and the instructor under whom the student wishes to work. Not more than 4 s.h. may be counted toward major work. (w) STAFF

FOR SENIORS AND GRADUATES

201. ANIMAL BEHAVIOR.—A review of the major developments in the field with emphasis on recent physiological and developmental studies. Prerequisites: physiology, genetics and evolution, or consent of instructor. 3 s.h.; 4 s.h. with laboratory. (w) KLOPFER

203. ECOLOGY.—Relation of animals to environment. Lectures, readings, reports, conferences; laboratory and field work. 4 s.h. (w) GRAY

210. EXPERIMENTAL GENETICS.—The relationship of phenotype to genome and environment; cytogenetics, recent research in the field of genetics. Prerequi-

sites: Principles of heredity (one of the following: Zoology 110, Botany 101, 202, or equivalent), or consent of instructor. 4 s.h. (w) WARD

214. BIOLOGICAL OCEANOGRAPHY.—Composition in time and space of marine biosphere in relation to descriptive marine chemistry, physics, and geology. Some work at sea aboard the research vessel. Prerequisites: A course in invertebrate zoology, ecology, marine biology or an appropriate equivalent; chemistry through organic; one year of physics and mathematics. 4 s.h. (Given at Beaufort only.) MENZIES

215. GENERAL PHYSICAL AND CHEMICAL OCEANOGRAPHY.—Relief of the ocean floor; physical and chemical properties of sea water; distribution of temperature, salinity and density; heat budget; sea ice; light; ocean currents, waves and tides; selected topics of regional oceanography. Prerequisites: One year each of physics and chemistry, Mathematics 22 or equivalent. 6 s.h. (Given at Beaufort only.) STEFÁNSSON

216. LIMNOLOGY.—A study of lakes, ponds and streams, including their origin, development, geochemistry, energy balance, productivity, and the dynamics of plant and animal communities living in them. Lectures, field trips, and laboratory work. Usually offered in alternate years. Prerequisites: one year each of biology, chemistry and physics, and Mathematics 21; or permission of instructor. 4 s.h. (w) LIVINGSTONE

222. ENTOMOLOGY.—Anatomy, physiology, embryology, and classification of insects. Prerequisite: One year of zoology. 4 s.h. (w) GRAY

224. VERTEBRATE ZOOLOGY.—A study of life histories, adaptations, ecology, and classification of vertebrate animals. Prerequisite: Zoology 53. 4 s.h. (w) BAILEY

228. EXPERIMENTAL EMBRYOLOGY.—Lectures, readings, reports, and laboratory work. 4 s.h. GREGG

238. SYSTEMATIC ZOOLOGY.—The fundamental theory and practice involved in the collection, identification, and classification of animals. Prerequisites: Zoology 1, 2. 4 s.h. (w) BAILEY

243. CYTOLOGY.—The structure of the cell. Lectures, readings, reports, and laboratory work. Prerequisites: Zoology 53, 92, 156 or equivalent and consent of instructor. (Combined course with Botany 203.) 4 s.h.

245. RADIATION BIOLOGY.—Actions of ionizing and excitational radiations on life processes: a survey and an adventure in biophysics. Prerequisites: College physics, mathematics and organic chemistry. 3 s.h., or 4 s.h. with laboratory (w) FLUKE

246. MOLECULAR BIOLOGY.—The nature, functional relationships, and replication of biological structure at the molecular level. Laboratory projects optional by arrangement. Prerequisites: College physics, mathematics, and organic chemistry. Biochemical and genetic background are suggested. 3 s.h., or 4 s.h. with instructor's advance approval of laboratory work. (w) FLUKE

247. BIOLOGICAL NUCLEONICS.—Laboratory instruction in biological uses of radioactive tracers, in counting instruments and measurements, and in legal requirements. Prerequisites: By consent of instructor and normally two years of biology and one year of college chemistry. 2 s.h. (w) FLUKE

250. PHYSIOLOGICAL ECOLOGY OF MARINE ANIMALS.—A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla and from various habitats are studied. Prerequisite: Zoology 151 or equivalent. 6 s.h. (Given at Beaufort only.) VERNBERG

252. COMPARATIVE PHYSIOLOGY.—The physiological mechanisms of animals studied on a comparative basis. Prerequisite: Zoology 151 or equivalent. 4 s.h. (w) K. SCHMIDT-NIELSEN

271. CELLULAR PHYSIOLOGY.—The physiological processes of living matter approached through studies of cells. Prerequisites: Two years of biology and at least one year of chemistry. 4 s.h. (w) WILBUR

274. INVERTEBRATE ZOOLOGY.—A study of structure, functions, and habits of invertebrate animals under normal and experimental conditions. Field trips will be made to study, collect, and classify animals in their natural habitats. Prerequisites: Zoology 1, 2. 4 s.h. (w) BOOKHOUT

276. PROTOZOOLOGY.—The morphology, physiology, taxonomy, and culture of protozoa. Prerequisites: Zoology 1, 2. 4 s.h. (w) BOOKHOUT

278. INVERTEBRATE EMBRYOLOGY.—Lectures, readings and laboratory work dealing with rearing, development, and life history of invertebrates. Prerequisite: Zoology 92. 4 s.h. (w) BOOKHOUT

MARINE LABORATORY. The following courses are given at Duke University Marine Laboratory, Beaufort, N. C.: 203, Marine Ecology; 214, Biological Oceanography; 215, General Physical and Chemical Oceanography; 250, Physiological Ecology of Marine Animals; 274, Marine Invertebrate Zoology. Consult the announcement of the Duke University Marine Laboratory.

DEPARTMENTAL MAJOR

Prerequisites: Zoology 1 and 2.

Major Requirements (for both A.B. and B.S. degrees): A minimum of 24 s.h. of zoology including at least one course in each of the following three areas: morphology (53, 92, 156, or 278), physiology (151 or 271), and genetics (71 or 110).

With the prior approval of the Director of Undergraduate Studies, up to 6 s.h. of advanced work in the natural and formal sciences, other than zoology, may be counted toward the 24 s.h. of the zoology major.

Related Work:

A.B. Degree: Related work will include at least one year of chemistry with additional work usually chosen from courses in botany, chemistry, geology, mathematics, or physics. The language requirement will preferably be met by French, German, or Russian.

B.S. Degree: Related work will include Chemistry 151 and 152 with additional work chosen from courses in botany, geology, mathematics or physics. Language requirements may be met by two languages, chosen from German, French, or Russian.

The Department offers work leading to graduation with distinction. See the section on Honors.

College of Engineering

CIVIL ENGINEERING

PROFESSOR BROWN, CHAIRMAN AND DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS BRYAN, VESIĆ, AND WILLIAMS; ASSOCIATE PROFESSORS HAINES AND PALMER; ASSISTANT PROFESSORS ARGES, BARTON, HARRAWOOD, HILL, HOLLAND, AND WOOD; VISITING ASSOCIATE PROFESSOR KUMAR; MESSRS. RAJAN AND SHEPPARD

CE 61. PLANE SURVEYING.—Use and adjustment of instruments; transit-tape, stadia, and plane table surveying; differential and profile leveling; calculation of bearings, latitudes, departures, and areas; accuracy and errors; topographic mapping; rural and urban land surveys; celestial observations for azimuth; triangulation; introduction to photogrammetry. Prerequisites: Engrg. 1 and Math 21. 5 s.h. (w) SHEPPARD

CE 72. MATERIALS LABORATORY.—Blending of granular materials and determination of their physical properties, design of concrete and bituminous mixtures, consistency limits of soils. 1 s.h. (w) HOLLAND

CE 101. SOIL MECHANICS LABORATORY.—Soil exploration and sampling. Laboratory determination of index properties: water content, void ratio, particle size, Atterberg limits. Consolidation testing. Triaxial shear testing. Classification and identification of soils. Compaction testing. Demonstrations of seepage, bearing capacity and earth pressure phenomena. Concurrent: CE 135. 1 s.h. (w) HOLLAND AND VESIĆ

CE 110. *PLANE SURVEYING.—Use and adjustment of instruments; transit-tape, stadia, and plane table surveying; differential and profile leveling; calculation of bearings, latitudes, departures, and areas; accuracy and errors. Prerequisites: Engrg. 1 and Math 21. 3 s.h. (w) ARGES

CE 113. ROUTE SURVEYING.—Simple, compound and reverse curves; spirals; earthwork and grading plans. Prerequisite: CE 61. 2 s.h. (w) SHEPPARD

CE 116. TRANSPORTATION ENGINEERING.—Location, design, construction and maintenance of highways and city streets; soil stabilization; traffic studies; economics of planning and design. Prerequisite: CE 113 and 135. 3 s.h. (w) HOLLAND

CE 118. MATERIALS OF ENGINEERING.—Behavior of materials under load; mechanical properties as criteria for failure; elementary metallurgy. Ferrous and non-ferrous metals and non-metalic materials. Prerequisites: Engrg. 107 and 109 2 s.h. (w) PEARSALL

CE 121. *HYDROLOGY.—Fundamentals of meteorology; precipitation; evaporation. Ground water development. Stream flow and stream gaging. Hydrograph analysis. Flood routing. Field trips to be arranged. Prerequisite: Engrg. 128. 3 s.h. (w) WILLIAMS

CE 123. HYDRAULIC ENGINEERING.—Pipe flow, compound pipe systems, network analysis, analysis and problems on pumps and turbines, fundamental aspects of hydrology. Open channel flow, non-uniform flow computations. Irrigation and drainage problems. Flood control and hydraulic structures. Prerequisite: Engrg. 128. 3 s.h. (w) HARRAWOOD

CE 124. FUNDAMENTALS OF SANITARY ENGINEERING.—Engineering and public health aspects of water treatment and supply, waste treatment and disposal, and environmental sanitation. Design basis for collection and treatment facilities.

* Offered only upon sufficient demand; enrollment limited.

Laboratory procedures and interpretation of results. Prerequisites: Chemistry 2 and CE 123. 3 s.h. (w) BRYAN

CE 126. *SANITARY ENGINEERING DESIGN.—Design of facilities for providing an adequate supply of water and means for treatment and disposal of wastes. Stream sanitation as it affects location and design of treatment works. Prerequisite: CE 124. 3 s.h. (w) BRYAN

CE 131. STRUCTURAL MECHANICS I.—Shears, moments, and internal forces by algebraic and graphic methods under various conditions of loading. Deflection of trusses. Prerequisite: Engrg. 107. 3 s.h. (w) BROWN

CE 132. STRUCTURAL DESIGN.—Tension, compression, flexural members, eccentric connections, unsymmetrical bending, riveted and welded plate girders, trusses and office building frames. Timber design using ring connectors. Design and detail drawings. Prerequisite: CE 131. 4 s.h. (w) PALMER

CE 133. REINFORCED CONCRETE.—Theory and design of reinforced concrete beams, columns and footings. Moment distribution. Prerequisite: CE 131. 3 s.h. (w) PALMER

CE 135. INTRODUCTION TO SOIL MECHANICS.—Origin and composition of soils, soil structure. Flow of water through soils, capillary and osmotic phenomena. Soil behavior under stress; compressibility, shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes. Prerequisites: Engrg. 107, 109, and 128; concurrent: CE 101. 2 s.h. (w) VESIĆ

CE 140. STRUCTURAL MECHANICS II.—Analysis of statically indeterminate structures by various methods including those of elastic energy. Prerequisite: CE 3. 3 s.h. (w) BARTON

CE 143, 144. *PROJECTS IN CIVIL ENGINEERING.—This course may be assigned by the Chairman of the Department to certain seniors who have shown an aptitude for research, in which case it may be substituted for certain civil engineering courses. 3-6 s.h. (w) STAFF

CE 146. PROFESSIONAL ENGINEERING.—Topics related to the practice of civil engineering: engineering economy, contracts, specifications, and ethics. Presentation of student papers on historical and current aspects of civil engineering. Seniors only. 2 s.h. (w) PALMER

CE 148. *STRUCTURAL ENGINEERING.—Structural design utilizing metals, concrete and timber. Planning, preliminary design, organization of design procedures and specifications. Prerequisites: CE 132 and CE 133. 3 s.h. (w) PALMER

CE 154. *GEOMETRIC THOROUGHFARE DESIGN.—Analysis and design of municipal street systems. Origin-destination surveys; control of traffic flow; grade, rotary, and grade-separation intersections. Prerequisite: CE 113. 3 s.h. (w) WILLIAMS

CE 201. *ADVANCED MECHANICS OF MATERIALS.—Analysis of structural elements described by ordinary differential equations, such as beams on an elastic foundation, curved beams, beam-columns, circular plates; introduction to plates and shells; energy principles and their use in structural analysis. 3 units. (w) HILL

CE 202. *EXPERIMENTAL STRESS ANALYSIS.—The experimental analysis of stress and strain in deformable bodies, correlation of theory with data from experiments; photoelasticity; strain gages; dimensional analysis and similitude principles of models. 3 units. (w) HILL

CE 205. *APPLIED ELASTICITY.—Introduction to linear theory of elasticity; solutions of two-dimensional problems; three-dimensional problems of torsion and bending; stress concentrations; energy and variational principles with applications to design. 3 units. (w) HILL AND MERIAM

CE 211. *MECHANICAL BEHAVIOR OF MATERIALS.—Macroscopic mechanical properties of materials for static, fatigue, dynamic and creep conditions; impact, shock, and stress wave properties; temperature, creep, viscoelastic and relaxation properties. 3 units. (w) KUMAR

CE 221. *INCOMPRESSIBLE FLUID FLOW.—Steady and unsteady pipe flow,

theories of turbulent flow; water hammer theory and control; surge tanks; air chambers; the analysis and control of fluid systems; effect of resistance; tapered conductors. 3 units. (w) HARRAWOOD AND WOOD

CE 231. *STRUCTURAL ENGINEERING.—The application of the fundamental theories of structural action to the design and analysis of structural members; specifications. 3 units. (w) BARTON

CE 232. *REINFORCED CONCRETE DESIGN.—Design and analysis of reinforced concrete members including the influence of shrinkage and plastic flow; bond and diagonal tension; prestressed concrete members. 3 units. (w) BROWN

CE 235. *FOUNDATION ENGINEERING.—An introduction to methods of analysis, design and construction of foundations. Bearing capacity and settlement of shallow and deep foundations. Soil exploration; excavation and bracing; drainage and stabilization; underpinning. Foundation vibrations. 3 units. (w) VESIĆ

CE 243, 244. *SANITARY ENGINEERING UNIT OPERATIONS AND PROCESS DESIGN.—Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and bio-treatment processes. 6 units. (w) BRYAN

CE 250. *ENGINEERING ANALYSIS.—General concepts of the solutions of engineering problems with special emphasis on digital and analog computer and numerical methods; deflection and stability; torsion of noncircular beams and multicelled thin-walled structures; vibrations of beams and membranes; structures with both uniform and nonuniform properties and with rigid and nonrigid supports. 3 units. (w) WOOD

The Department offers work leading to graduation with distinction. See the section on Honors.

ELECTRICAL ENGINEERING

PROFESSOR WILSON, CHAIRMAN; PROFESSOR MEIER, DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS OWEN AND VAIL; VISITING PROFESSOR KRAUSS; ASSOCIATE PROFESSORS ARTLEY AND KRAYBILL; ADJUNCT ASSOCIATE PROFESSOR BURGER; ASSISTANT PROFESSORS GEORGE AND PILKINGTON; LECTURERS JENKINS, OLIVE, AND WORTMAN; VISITING LECTURER WELLS; INSTRUCTORS ABSHER, BARNES, AND PALMER; MESSRS. BUMGARDNER, FENG, FREKKO, JONES, OWSLEY, AND ROE

EE 53. ELECTRICAL ENGINEERING FUNDAMENTALS.—Survey of electrical engineering profession: role of engineering and professional engineering societies in national life; engineering economy; engineering law; technical engineering problems; basic philosophy of engineering education; introduction to staff, curriculum, and facilities of Department of Electrical Engineering. One two-hour session. 1 s.h. (w) KRAYBILL AND PILKINGTON

EE 55. ELECTRIC NETWORKS I.—Physical nature of circuit parameters and sources of excitation; volt-ampere relations for circuit elements; network topology; network equations using loop currents and node voltages; solutions of network differential equations by classical and transform methods. Concurrent: Mathematics 63 and Physics 41. Three class sessions and one two-hour computation. 4 s.h. (w) PALMER AND VAIL

EE 56. ELECTRIC NETWORKS II.—Network impedance and admittance functions; steady-state response to sinusoidal forcing; Fourier series analysis; pole-zero analysis of networks; matrices in network analysis; introduction to synthesis of reactance networks. Prerequisite: EE 55. Concurrent: Mathematics 64. Three class sessions and one two-hour computation. 4 s.h. (w) GEORGE AND PALMER

EE 109-110. ELECTROMAGNETIC SYSTEMS.—Mathematical and physical consideration of energy relations and forces associated with both discrete particles and materials in electromagnetic fields: vector notation; Maxwell's equations; static and quasi-static fields; energy, power flow, and impedance; particle ballistics; electron emission; control of conduction in vacuums, gases, liquids, and solids; resistance,

* Offered only upon sufficient demand; enrollment limited.

capacitance, and inductance of systems of conductors; forces between relatively moving bodies; dielectric and magnetic material. Prerequisite: EE 56. Concurrent: Mathematics 111. Three class sessions and one two-hour computation. 8 s.h. (w) ABSHER AND ARTLEY

EE 111-112. ELECTRICAL PRINCIPLES LABORATORY.—Instruction in electrical laboratory techniques; experimental study of basic principles of electromagnetics, electronics, and electric and magnetic circuits. Prerequisite: EE 56. Concurrent: EE 109-110. Two three-hour laboratory periods throughout first semester; one throughout second semester. 3 s.h. (w) ABSHER, FREKKO, AND PALMER

EE 123. FUNDAMENTALS OF ELECTRICAL ENGINEERING.—Introductory treatment of electrical engineering fundamentals for students majoring in other branches of engineering; principles of electric circuits, fields, and electronics. Prerequisites: Mathematics 63 and Physics 42. Concurrent: EE 125. Three class sessions. 3 s.h. (w) BARNES AND WORTMAN

EE 124. INDUSTRIAL ELECTRICAL ENGINEERING.—Introductory treatment of industrial applications of electrical engineering fundamentals for students majoring in other branches of engineering: alternating- and direct-current machinery; electronic and electromagnetic control systems; illumination principles. Prerequisite: EE 123. Concurrent: EE 126. Three class sessions. 3 s.h. (w) BARNES

EE 125. ELECTRICAL FUNDAMENTALS LABORATORY.—Laboratory course paralleling course EE 123, with which it should be taken concurrently. One three-hour laboratory. 1 s.h. (w) FENG AND OWSLEY

EE 126. INDUSTRIAL ELECTRICAL LABORATORY.—Laboratory course paralleling course EE 124, with which it should be taken concurrently. One three-hour laboratory. 1 s.h. (w) FENG, FREKKO, AND OWSLEY

EE 127. *ELECTRONICS FOR ENGINEERS.—Introductory treatment of principles and applications of engineering electronics for students majoring in other branches of engineering: amplifiers; feedback; basic communications and control circuits; electronic computers. Prerequisite: EE 123 and permission of instructor. Three class sessions. 3 s.h. (w) STAFF

EE 159. *TRANSMISSION.—Development of theory underlying transmission of electric energy over conductors at both power and communication frequencies. Two class sessions and one two-hour computation. Prerequisite: EE 110; Mathematics 111. Elective for electrical majors. 3 s.h. (w) STAFF

EE 165-166. ELECTRICAL ENGINEERING SEMINAR.—A course which provides an opportunity to consider matters related to the professional practice of electrical engineering; to relate the undergraduate program of studies to current practice; and to improve the ability to communicate more effectively, both in verbal and written form, particularly with regard to technical material. One class session. 2 s.h. (w) STAFF

EE 173-174. *PROJECTS IN ELECTRICAL ENGINEERING.—A course which may be undertaken only by seniors who show special aptitude, or who may have had previous experience directly related to the proposed project. The consent of the Chairman of the Department must be obtained before registering. Elective for electrical majors. 3-6 s.h. (w) STAFF

EE 177. *ENERGY TRANSMISSION AND RADIATION.—A more advanced treatment of electromagnetic theory than is afforded by EE 109-119, with particular application to wave guides and antennas. Prerequisite: EE 110 and permission of instructor. Three class sessions. 3 s.h. (w) ARTLEY

EE 179. *ADVANCED ELECTRICAL MEASUREMENTS.—Theory and practice of measurements of electrical quantities at extremes of voltage, current, power, and frequency. Two class sessions and one three-hour laboratory. Prerequisite: EE 110 and permission of instructor. 3 s.h. (w) OWEN

EE 181-182. ELECTRONIC NETWORKS.—Advanced topics in engineering electronics: piece-wise linear approximation for nonlinear operation and incremental models for linear operation of basic electronic circuits; narrow- and wide-band amplifiers; feedback amplifiers; oscillators; modulation and demodulation; micro-

wave devices; communication systems. Prerequisite: EE 110. Concurrent: EE 183-184. Three class sessions. 6 s.h. (w) GEORGE, KRAUSS, AND PILKINGTON

EE 183-184. ELECTRONICS LABORATORY.—Laboratory course paralleling and integrated with course EE 181-182, with which is should be taken concurrently. One three-hour laboratory. 2 s.h. (w) BARNES, FENG, GEORGE, AND ROE

EE 191-192. ELECTRIC MACHINERY.—Application of circuit and field principles to underlying theory of static and rotating electric machinery; mathematical techniques for analyzing transformers and electromechanical energy converters as individual devices and when interconnected into systems. Prerequisite: EE 110. Concurrent: EE 193-194. Three class sessions. 6 s.h. (w) JENKINS AND MEIER

EE 193-194. ENERGY CONVERSION LABORATORY.—Selected experiments in energy conversion combining the theory and practice of transformers, electromechanical devices including motors and generators, photovoltaic sources, thermoelectric generators, static d-c to a-c and d-c to d-c converters. Prerequisite: EE 112. Concurrent: EE 192-193. 2 s.h. (w) BUMGARDNER, MEIER, AND ROE

EE 199. *LINEAR FEEDBACK SYSTEMS.—Analysis and design of linear; continuous-data feedback control systems; stability tests; time and frequency domain methods; root locus method; performance specifications; study of electrical, mechanical, hydraulic, aerodynamic, pneumatic, and thermal systems. Two class sessions and one three-hour laboratory. Prerequisite: Permission of instructor. 3 s.h. (w) WELLS

EE 201. ENERGY SYSTEMS.—Application of general energy concepts to specific engineering devices and systems; use of mathematical models to describe concepts of energy storage, transfer, transformation, and control that are applicable to electromagnetic, mechanical, fluid, and thermal systems; the Lagrangian, Hamiltonian formulation, and tensors. Prerequisite: Permission of instructor. 3 units. (w) ARTLEY

EE 203, 204, INFORMATION SYSTEMS.—General concepts of information storage, transfer, and processing: information theory, coding, noise theory, and response of information-handling systems in the time and frequency domains. Applications of information concepts to specific engineering situations: modulation, sampling, optimum filtering, detection in presence of noise, and comparisons of various systems. Prerequisite: Permission of instructor. 6 units. (w) GEORGE AND OWEN

EE 207. *NETWORK SYNTHESIS.—Linear network theory, including a review of time and frequency domain analysis; network graphs; network functions and realizability conditions; driving point impedance synthesis of passive networks; driving point and transfer specifications; approximation methods. Prerequisite: Permission of instructor. 3 units. (w) KRAUSS, OWEN, AND VAIL

EE 211. SOLID-STATE THEORY.—The fundamental theory of wave motion in solids, including wave mechanics; variational method; perturbation theory; many-electron problems; one-electron approximation; free-electron approximation; electron spin; Brillouin zones; time-dependent Schrodinger's equation; and transition probabilities. Introduction to the thermodynamics of solids, including Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; ensembles; entropy; and free-energy functions. Prerequisite: Permission of instructor. 3 units. (w) ARTLEY, BURGER, PILKINGTON, AND VAIL

EE 212. SOLID-STATE MATERIALS.—Concepts of solid state physics as applied to engineering materials: electrical, magnetic, thermal, and mechanical properties of solids: dielectrics; ferroelectrics; semiconductors; magnetic materials; and superconductors. Prerequisite: EE 211. 3 units. (w) ARTLEY, BURGER, PILKINGTON, AND VAIL

EE 213. MAGNETICS.—A study of ferromagnetic and ferrimagnetic materials, including effects of thermal conditions and treatment, mechanical stress, magnetic field intensity, crystal structure and macroscopic geometry. Study emphasizes relationships of fundamental concepts of engineering interest. Prerequisite: EE 211 or equivalent. 3 units. (w) ARTLEY AND WILSON

* Offered only upon sufficient demand; enrollment limited.

EE 222. NONLINEAR ANALYSIS.—Introduction to methods of analyzing engineering systems described by nonlinear differential equations: analytic, numerical, graphical, and series approximation methods; analysis of singular points; stability of nonlinear systems. Application of various methods, such as the modified Euler, Runge-Kutta, isoclines, perturbation, reversion, variation of parameters, residuals, harmonic balance, Bendixon, and Liapounov to phenomena of nonlinear resonance, subharmonics, relaxation oscillations, and forced oscillating systems. Prerequisite: Permission of instructor. 3 units. (w) WILSON

EE 231. *NUCLEAR ENGINEERING.—Review of nuclear physics; fission and the chain reaction; nuclear reactor principles; materials, instrumentation, and control of nuclear reactors; selected applications and techniques of nuclear engineering. Prerequisite: Permission of instructor. 3 units. (w) MEIER

EE 241. *FEEDBACK CONTROL SYSTEMS.—Analysis and design of linear sampled-data systems; linear systems subjected to random inputs; analytical design using mean square error and integral square error criteria; nonstationary and nonlinear systems. Prerequisite: Permission of instructor. 3 units. WELLS AND WILSON

EE 259. *ADVANCED ELECTRIC ENERGY CONVERSION.—Equations of motion of electromechanical systems, fields and lumped parameters, state function concepts; mathematical techniques for analyzing electromechanical devices and systems; transducers; unified treatment employing matrix, tensor, and block-diagram concepts to obtain response under static and dynamic conditions; the generalized rotating machine. Prerequisite: Permission of instructor. 3 units (w) MEIER AND WILSON

The Department offers work leading to graduation with distinction. See the section on Honors.

ENGINEERING SUBJECTS COMMON TO ALL CURRICULA

ENGRG 1. ENGINEERING DESIGN I.—The study of elementary engineering graphics with emphasis on third angle projection, pictorial drawing, dimensioning, working drawings, pencil and ink techniques. 2 s.h. (w) HAINES, LEWIS, AND STAFF

ENGRG 2. ENGINEERING DESIGN II.—A study of drawing board geometry with emphasis on line and plane problems, developments, and intersections. Further emphasis on drawing techniques. Prerequisite: Engrg 1. 2 s.h. (w) HAINES, LEWIS, AND STAFF

ENGRG 57. STATICS.—A study of force systems equilibrium by algebraic and graphic methods, friction, centroids, moments of inertia. Prerequisite: Engrg 1; concurrent: Phys 41 and Math 63. 3 s.h. (w) ARGES

ENGRG 60. ENGINEERING MECHANICS.—A study of statics and dynamics, as applied to particles and rigid bodies. Fundamentals are developed using vector and scalar values. Concurrent: Phys. 41 and Math 63. 4 s.h. (w) ARGES, BARTON, AND WOOD

ENGRG 107. MECHANICS OF MATERIALS.—Stresses and strains in elastic bodies; shear and moment diagrams; stresses in beams; beam deflections by double integration and area—moments; statically indeterminate beams, torsion, principal stresses. Prerequisite: Engrg 57 or Engrg 60; concurrent: Math 64. 3 s.h. (w) ARGES AND PALMER

ENGRG 109. MECHANICS OF MATERIALS LABORATORY.—Study and use of testing machines and strain gages; tests to determine significant mechanical properties of common engineering materials; experimental verification of the elementary theory of structural members. Concurrent: Engrg 107. 1 s.h. (w) BARTON AND SHEPPARD

ENGRG 115. DYNAMICS.—General principles of dynamics as applied to particles and rigid bodies. Translation, rotation, general plane motion, work and energy, impulse and momentum, gyroscopic motion. Prerequisite: Engrg 57; concurrent: Math 64. 3 s.h. (w) WOOD

ENGRG 128. FLUID MECHANICS.—Physical properties of fluids, fluid statics, continuity and energy principles, pressure-momentum principle, elementary principles of turbines and pumps, flow of a real fluid, dimensional analysis and dynamic

similarity, fluid flow in closed conduits and in open channels; fluid measurements. Prerequisite: Engrg 60, or concurrent: Engrg 115; prerequisite: Math 64. 3 s.h. (w) HARRAWOOD AND KUMAR

ENGRG 153. *ARCHITECTURAL ENGINEERING.—The application of engineering principles to architecture; the influence of engineering function and trends on design; the interrelationship of engineering with architecture; the analysis of structural details and of processes of construction; field trips and inspection of construction projects. Prerequisite: Permission of instructor. 3 s.h. (w) HAINES

ENGRG 169. *LEGAL ASPECTS OF ENGINEERING.—A course designed to introduce engineering students to those aspects of the law encountered in the practice of engineering. Subjects included are: contracts and specifications, real and personal property, torts, insurance, agency, equity, evidence, labor management, sales, expert testimony, engineering registration and ethics. Open to seniors only. 3 s.h. (w) OLIVE

ENGRG 170. *PATENT LAW FOR ENGINEERS.—A course designed to familiarize engineering students with the legal principles and procedures for protecting patentable inventions, such as drafting and analysis of specifications and claims, study of infringements, assignments, licenses, and record documentation. Open to seniors only. 3 s.h. (w) OLIVE

MECHANICAL ENGINEERING

PROFESSOR KENYON, ACTING CHAIRMAN AND DIRECTOR OF UNDERGRADUATE STUDIES; PROFESSORS MACDUFF AND MERIAM; ASSOCIATE PROFESSORS BOYLE, ELSEVIER, AND PEARSALL; ASSISTANT PROFESSORS BUZZARD, HARMAN, LEWIS, AND NASH; VISITING PROFESSOR DJORDJEVIC; VISITING LECTURER MIXON; MESSRS. BIGGERS, BREALEY, KIM, TITUS AND WYATT

ME 52. KINEMATICS, KINETICS.—Analytical and numerical studies of displacement, velocity, and acceleration in mechanical elements and systems. Synthesis and analysis of mechanisms for automatic machines, application of work, energy, impulse and momentum. Prerequisite: Engrg 2. Concurrent: Phys 41, Math 63. 3 s.h. (w) NASH

ME 59. MATERIALS AND PROCESSES.—Elementary metallurgy and introduction to modern theories of the solid state; selection and properties of engineering materials and effect of forming processes upon properties. Prerequisite: Senior standing. 3 s.h. (w) PEARSALL

ME 101-102. ENGINEERING THERMODYNAMICS.—A basic study of the laws of thermodynamics and their use in engineering analysis and design. Properties of pure substances; vapor cycles; fluid flow; thermodynamic machinery; introduction to combustion processes. Prerequisite: Chem 1, Phys 42. Concurrent: Math 64. 6 s.h. (w) HARMON, ELSEVIER AND KENYON

ME 103. THERMODYNAMICS.—A terminal course in thermodynamics and its engineering applications for civil and electrical engineering students. The basic laws of thermodynamics; gases; vapors; elements of combustion and heat transfer. Prerequisite: Chem 1, Phys 42. Concurrent: Math 64. 3 s.h. (w) ELSEVIER AND MIXON

ME 105. DYNAMICS OF FLUIDS.—A study of liquids at rest and in motion. Principles of laminar and turbulent flow through pipes, orifices, nozzles, and metering devices; impulse and momentum concepts; vortex action, pumps, turbines and fluid couplings; resistance of immersed and floating bodies. Prerequisite: Phys 41, Math 63. 3 s.h. (w) KENYON AND MACDUFF

ME 106. HEAT TRANSFER.—A basic course covering the elements of radiation, conduction, and convection. Methods of temperature measurement, steady and transient heat flow, analytical and numerical methods. Concurrent: ME 101, 105; Math 64. 3 s.h. (w) KENYON AND MIXON

ME 114. JUNIOR MECHANICAL ENGINEERING LABORATORY.—Measure-

* Offered only upon sufficient demand; enrollment limited.

ment of mechanical and thermodynamic properties of systems. Student planning and reporting of laboratory experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Prerequisite: ME 101, 105. 2 s.h. (w) STAFF

ME 116. MECHANICAL ENGINEERING LABORATORY.—Primarily for civil and electrical engineering students. Selected laboratory experiments in measuring mechanical and thermodynamics properties of systems. Student planning of experiments in temperature, pressure, velocity, acceleration, flow, energy and power measurements. Concurrent: ME 103. 1 s.h. (w) STAFF

ME 128. *DYNAMICS OF GASES.—The flow of compressible fluids at high velocities. One-dimensional compressible flow; area change; normal shock; friction and heat transfer; Mach number. Prerequisite: ME 102. Concurrent: ME 106. 3 s.h. (w) STAFF

ME 141. MACHINE DESIGN.—Elements of mechanism with special attention to the role of invention in mechanical design. Velocity and acceleration in mechanisms from both scalar and vector viewpoints. Prerequisite: Math 63. Concurrent: ME 52, E 57 or 60. 3 s.h. (w) NASH

ME 142. MACHINE DESIGN.—Continuation of ME 141. Static and dynamic forces in machinery. The instant center; theory of gear tooth profiles. Design of machine elements, such as gears, springs, and bearings; complex parts. Prerequisite: ME 141. Concurrent E 107. 3 s.h. (w) NASH

ME 153. *HEATING, AIR CONDITIONING, AND REFRIGERATION.—Principles of thermodynamics, heat transfer, and fluid flow applied to comfort and industrial air conditioning. Cycles and equipment for heating, cooling, and humidity control. Air transmission and distribution. Modern vapor compression, absorption and low temperature refrigeration cycles and systems. Prerequisite: ME 102 and 106. 3 s.h. (w) ELSEVIER

ME 156. COMBUSTION ENGINES.—A study of cycles, fuels, and fuel mixtures in piston, ram jet, and rocket engines. Comparison of real and theoretical cycles; carburetion and fuel injection systems; modern developments. Prerequisite: ME 102. 3 s.h. (w) ELSEVIER

ME 157. *PUMPS, COMPRESSORS AND TURBINES.—An introduction to the theory and design of centrifugal pumps and compressors, axial-flow compressors, impulse and reaction turbines, and gas turbine plants, combustion systems and regenerators. Concurrent: ME 102 and 106. 3 s.h. (w) BOYLE

ME 159-160. SENIOR MECHANICAL ENGINEERING LABORATORY.—Laboratory determination of heat flow and operating characteristics of engines, fans, pumps, and other power and refrigeration plant components; vibrational systems, control systems, analog methods. Student planning and reporting of original experiments. 2 s.h. (w) STAFF

ME 162. POWER PLANTS.—Basic concepts of thermodynamics, heat transfer and fluid flow are combined with industrial data for the consideration of real power plant problems. Selection of steam generators, prime movers, fans, pumps, heaters, and piping systems with regard to engineering and economic points of view. Prerequisite: ME 102. 3 s.h. (w) HARMAN

ME 163. *VIBRATION CONTROL.—An introduction to the dynamics of mechanical systems; equilibrium, stability lumped and distributed systems, cradle and field balancing. System analysis by classical differential equations, mechanical impedance, operational calculus and analog stimulation. Prerequisite: Math 64. ME 141. 3 s.h. (w) BUZZARD

ME 164. *ENGINEERING ANALYSIS.—A study of a series of engineering problems with particular reference to mathematical and graphical methods of solution and engineering interpretation of results. Concurrent: Math 64. 3 s.h. (w) BOYLE

ME 166. *AIR CONDITIONING DESIGN.—Typical air conditioning systems considered in relation to specific problems. Equipment analysis and performance, economic considerations, system control and response, noise generation and attenuation. Prerequisite: ME 153. 3 s.h. (w) ELSEVIER

ME 167. INDUSTRIAL ENGINEERING.—A study of the organization and functioning of industries; function of engineering in industry; job analysis and self evaluation; professional and executive responsibility of the mechanical engineer. Prerequisite: Senior standing. 3 s.h. (w) LEWIS

ME 168. *INDUSTRIAL ENGINEERING PRODUCTION METHODS.—Study of engineering theory, methods and controls in production. Methods, motion and time study, plant lay-out, production and quality control, industrial safety, operations research. Prerequisite: Senior standing, ME 167 or equivalent. 3 s.h. (w) LEWIS

ME 171. RESPONSE OF PHYSICAL SYSTEMS.—An introduction to the basic fundamentals of instrumentation and of the control of processes and systems with emphasis on correlation of analysis and experimental results. Prerequisite: Math 111. 3 s.h. (w) BUZZARD AND MACDUFF

ME 173-174. MECHANICAL ENGINEERING SEMINAR.—A course designed to keep the students abreast of progress in the engineering field and to develop their ability to express ideas effectively in speech and writing. Open to seniors only. 2 s.h. (w) STAFF

ME 182. *FUNDAMENTALS OF NUCLEAR ENGINEERING.—Review of nuclear physics, nuclear interactions and cross sections, neutron induced chain reactions, shielding, hazards, isotope utilizations, reactor systems and power reactors. Prerequisite: Permission of instructor. 3 s.h. (w) KENYON

ME 197-198. PROJECTS IN MECHANICAL ENGINEERING.—This course may be assigned by the Chairman of the Department to outstanding seniors who express a desire for such work and who have shown aptitude for research in one distinct field of mechanical engineering. Prerequisite: 3.0 average and senior standing. 1-6 s.h. (w) STAFF

ME 201. *THEORETICAL AND APPLIED MECHANICS.—Introduction to the theory of elasticity and vibration analysis. 3 units. (w) MERIAM

ME 202. *THEORETICAL THERMODYNAMICS.—Classical thermodynamics based on the First, Second, and Third Laws of Thermodynamics. Classical and statistical thermodynamics of ideal gases. Properties of real gases, equilibrium, combustion, and irreversible processes. 3 units. (w) HARMAN

ME 221. *ANALYSIS OF INCOMPRESSIBLE AND COMPRESSIBLE FLUID FLOW.—Flow of incompressible and compressible fluids; concepts of subsonic, sonic and supersonic flow; experimental methods. 3 units. (w) HARMAN

ME 222. *ANALYSIS OF HEAT TRANSFER.—Heat transfer by conduction, convection, and radiation; lumped and distributed heat capacity, resistance, losses; steady and transient flow. 3 units. (w) KENYON

ME 231-232. *SYSTEMS ENGINEERING.—Methods of obtaining parameters for strength, response, and stability studies of mechanical systems. Impedance and operational means of analysis; mechanical and electronic analogs; nonlinear theories. 6 units. (w) MACDUFF

ME 265. *ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 units. (w) MEMBERS OF THE GRADUATE STAFF

ME 280. *NUCLEAR REACTOR POWER CYCLES.—Introduction to basic reactor principles and reactor types. Consideration of thermodynamic cycles for nuclear reactors for stationary and mobile plants. Analysis of fluid flow and heat transfer problems unique to reactors with development of methods of reactor safety techniques. Metallurgical problems peculiar to reactor design. 3 units. (w) KENYON

The Department offers work leading to graduation with distinction. See the section on Honors.

* Offered only upon sufficient demand; enrollment limited.

THE DIVINITY SCHOOL

Fall semester begins September 23, 1965
Spring semester begins February 3, 1966

General Information

HISTORICAL STATEMENT

THE indenture of Trust signed on December 11, 1924, by Mr. James B. Duke, which established Duke University, mentioned first among its objects the training of ministers of the Gospel. The Divinity School was, accordingly, the first of the graduate professional schools to be organized. Its work began with the year 1926-1927, the formal opening exercises being held on November 9, 1926.

The Reverend Doctor Edmund Davison Soper was the first Dean of the Divinity School. He resigned in 1928 to become President of Ohio Wesleyan University, and was succeeded by the Reverend Doctor Elbert Russell, and the latter in turn in 1941 by the Reverend Doctor Paul Neff Garber. In 1944, Dean Garber was elected to the episcopacy of the Methodist Church, and Doctor Harvie Branscomb assumed the duties of the Dean's office. In 1946, Dean Branscomb became Chancellor of Vanderbilt University, and in 1947 the Reverend Doctor Paul E. Root was elected Dean but died before he could assume the office. The Reverend Doctor Harold A. Bosley became Dean in 1947 and resigned in 1950 to become the pastor of the First Methodist Church, Evanston, Ill. The Reverend Doctor James Cannon was appointed Dean of the Divinity School March 1, 1951. After a period marked by important administrative integration of the School, Doctor Cannon resigned the duties of deanship, September 30, 1958. The Reverend Professor Robert Earl Cushman was elected Dean and assumed the responsibilities of the office October 1, 1958.

THE PURPOSE OF THE DIVINITY SCHOOL

The primary purpose of the Divinity School is to provide training for properly qualified persons planning to enter the Christian ministry. This includes not only prospective ministers in local churches, but also those preparing themselves to be missionaries at home and abroad, ministers of Christian Education, teachers of religion, and chaplains. Vital to all of these forms of service is a full understanding of the beginnings, content, and history of the Christian faith and its special pertinence for the spiritual needs of the modern world. Studies of a broad and thorough character directed toward such an understanding constitute the center of the curriculum of the Divinity School and are regarded as the basic training for all prospective Christian ministers. Specific instruction in the skills required of local ministers

and of leaders in the work of Christian Education is also provided. As funds become available for the purpose and as needs appear, additional training in specialized skills and areas of knowledge will be added to the curriculum.

Bound by ties of history and obligation to The Methodist Church, the Divinity School is ecumenical in its interests and outlook. Its faculty is limited to no one denomination, but draws upon the resources of them all. Students of the several denominations are admitted on an equal basis. The Divinity School conceives its task to be one of broad service to the Church in all of its forms.

THE RELATION OF THE DIVINITY SCHOOL TO DUKE UNIVERSITY

The Divinity School is an integral part of the University and shares fully in its activities, privileges, and responsibilities. The Sunday services in the University Chapel give Divinity School students an opportunity to hear each year a number of leading ministers of the country. The University Libraries make easily accessible a rich collection of 1,700,000 volumes. Selected courses in the Graduate School of Arts and Sciences and in the professional schools are open to Divinity School students without payment of additional fees. The general cultural and recreational resources of the University are available to them on the same basis as to other students.

COURSES OF STUDY OFFERED BY THE DIVINITY SCHOOL

The Divinity School offers three courses of study. The basic course is that which leads to the degree of Bachelor of Divinity. This is a three-year course and is recommended to all those preparing themselves for the work of the parish ministry. Students who hold pastoral charges, or other remunerative work requiring any substantial time apart from their studies, may carry only reduced schedules of work, and, in most cases, unless work is taken in the Duke University Summer Session, will spend four years in completion of the requirements for the B.D. degree.

The Divinity School offers study leading to the degree of Master of Religious Education. This course is designed for persons who wish to take specialized positions in the work of Christian Education. The course does not provide a general preparation for the work of the regular ministry and cannot serve as a substitute for it. No exchange of credits between the two courses is permitted, nor can departmental courses taken be credited toward more than one degree.

A new program of study leading to the degree of Master of Theology (Th.M.) was instituted in the academic year 1960-1961. This course is planned to afford a limited number of superior students an

opportunity for intensive theological study beyond the B.D. degree. It is a terminal professional degree, ordinarily to be completed in a year, and not to be regarded as leading toward a doctorate.

The requirements for each of these degrees are stated on page 28 through 42 of this catalogue.

COURSES OF STUDY IN RELIGION OFFERED BY THE GRADUATE SCHOOL OF ARTS AND SCIENCES

Students who desire to pursue studies in religion leading to the degrees of Master of Arts or Doctor of Philosophy in Religion should register in the Graduate School of Arts and Sciences. Study and research may be pursued in three fields: (1) Biblical Studies; (2) Historical Studies, and (3) Systematic and Contemporary Studies. A list of courses approved by the Graduate Faculty for work in these fields, together with general requirements for admission to the Graduate School, may be found in the *Bulletin of the Graduate School.* This Bulletin is available on application to the Dean of the Graduate School of Arts and Sciences, Duke University.

Graduate students in religion are eligible for financial support under a regular University Fellowship, a Gurney Harriss Kearns Fellowship in Religion, administered by the Graduate School, or for one of the National Foundation fellowships such as Rockefeller, Woodrow Wilson or Danforth. Applications for fellowships administered by Duke University should be submitted to the Dean of the Graduate School by February 15.

Inquiries concerning specific requirements of the Program of Religion in the Graduate School should be addressed to Professor Waldo Beach, Director of Graduate Studies in Religion.

LIBRARY RESOURCES

The Divinity School Library, containing a collection of more than 120,000 volumes in the field of religion and closely related disciplines, affords an unusual wealth of material for the seminary student. Although it is an integral part of the University's nine-unit library system which possesses more than 1,700,000 books, the Divinity School Library has its own separate facilities in the Divinity School building. Its book collection is operated on the open stack system; and its reading room provides study facilities for students and housing space for the special reference collection in religion and for the current numbers of the more than 400 religious periodicals to which the Library subscribes.

Staffed by a Librarian and a Reference Librarian who are trained in theology as well as in library administration, and by a Circulation Staff of two persons aided by a number of student assistants, the

Divinity School Library offers a variety of reference services to assist the student in selecting and locating materials. The staff, in cooperation with the faculty, maintains a book and periodical collection to support both basic courses and advanced research in all major fields of religious studies.

The Divinity School Library is adjacent to the General Library and is internally connected with it by a corridor which gives easy access to its many departments. The seminary student is permitted to withdraw books from the collection of more than 1,000,000 volumes in the General Library, and to make use of its other resources and facilities which include manuscripts, archives, public documents, newspapers, periodicals, microfilm, maps, rare materials (among which are thirty prized ancient Greek manuscripts), reference assistance, and provision for the borrowing of books not in the Duke Libraries from the Library of the University of North Carolina and other institutions.

THE HENRY HARRISON JORDAN LOAN LIBRARY

Henry Harrison Jordan, distinguished member of the Western North Carolina Conference (1862-1931) was memorialized by his children in the establishment of an endowment in 1947. The Divinity School Librarian is the custodian of books purchased under this fund for loan, through postal services, to qualified ministers of all demominations or localities. The Jordan Loan Library undertakes to maintain a catalogue of up-to-date publications representative of the several theological disciplines and areas of the minister's professional interest. Books are loaned on application to the Librarian of the Divinity School from a printed catalogue supplied on request.

ORMOND MEMORIAL FUND

Established 1924 by Dr. J. M. Ormond, '02, and Mrs. Ormond, in memory of his mother and father, Mr. and Mrs. J. J. Ormond, the income to be used for the purchase of a collection of books on the rural church for the Library of the Divinity School at Duke University.

AVERA BIBLE FUND

Established 1895 by gift of Mrs. L. B. McCullers in memory of her husband, Willis H. Avera. The fund provides for the purchase of books to be used for the Divinity School Library.

LOUIS W. BAILEY MEMORIAL FUND

This memorial fund was established in 1958 by the Reverend A. Purnell Bailey in memory of his father. The income is to be used for books for the Divinity School Library.

THE WILLIAM ARTHUR KALE, JR., MEMORIAL FUND

William Arthur Kale, Jr. was a member of the Duke University class of 1958, a lover of sacred art and music, and a member of the University Chapel Choir. In his memory there was established in 1964, by the provision of his parents, Professor and Mrs. William Arthur Kale, Sr., a fund for the purchase of books and other materials in the area of fine arts and religious musicology for the perpetual enrichment of the holdings of the Divinity School Library.

CORPORATE WORSHIP

One of the most important aspects of a program of training for Christian service is warm and discriminating common prayer. The center of the corporate life of the Divinity School is its own place of worship, York Chapel. Regular chapel services are held, at which all students are expected to be present. Services are led by members of the faculty, by visiting ministers, and by members of the student body. Prayer groups are held in the dormitories weekly and special groups during the Lenten Season.

PUBLIC LECTURES

The Committee on Lectures and Public Events presented the following lecturers (with their topics) during the year 1964-65: The Reverend Dr. Eric Baker, Secretary of the Methodist Conference in Great Britain ("The Anglican-Methodist Discussion on Possible Union"); Dr. M. Jack Suggs, Professor of New Testament at Brite College of the Bible, Texas Christian University ("Wisdom Christology in the Gospel of Matthew"); Dr. Barnes Woodhall, Vice Provost in Charge of Medical Affairs, Duke University ("The Doctor's Dilemma"). The fourth Faculty Lecture was delivered by Professor Ray Petry ("The Critical Temper and the Practice of Tradition"). In addition, special lectures were presented by the Christian Missions Symposium and by the Student Fine Arts Committee.

THE JAMES A. GRAY LECTURESHIP

The James A. Gray Lectures were established in 1950 as part of the fund set up in 1947 by Mr. James A. Gray of Winston-Salem, North Carolina. This lectureship was once again delivered in connection with the Ministers' Convocation, held at the University in the Fall. The lecturers were Father Godfrey Diekmann, O.S.B., of St. John's Abbey, Minnesota and Dr. Robert E. Cushman, Dean of the Duke Divinity School. Their joint subject was "The Second Vatican Council." The four lectures were published in a special edition of the *Divinity School Review* in the Spring of 1965.

THE DIVINITY SCHOOL LIBRARY LECTURESHIP

In 1948 the Duke Divinity School Library Lectures were established by the Reverend George Brinkmann Ehlhardt for the purpose of bringing to the Divinity School a succession of religious leaders. The lecturer for 1964-65 was the Reverend Doctor Krister Stendahl, Professor of Biblical Studies at Harvard University. His subject was "A Detheologized Paul."

SYMPOSIUM OF CHRISTIAN MISSIONS

Each year, in collaboration with the Methodist Board of Missions, the Divinity School presents a team of distinguished participants in the world mission of the Church, usually including a secretary of missionary personnel and a Duke alumnus serving overseas. The general aims are "to inform students and faculty of the philosophy and work of missions as seen through the personal experience of speakers; to educate present and future ministers so that they will have a vital concern for the promotion of missionary education in the local church; and to evaluate the missionary enterprise as a significant force in the revolutionary world." The featured speaker in 1965 was Dr. J. Russell Chandran, Principal of United Theological College, Bangalore, India; the alumnus was the Rev. David L. Swain, '51, of Japan.

Program of Continuing Education

DIVINITY SCHOOL SEMINARS

THE Divinity School, with the support of the James A. Gray Fund, conducts each year a series of extension Seminars consisting of two-day study courses for Divinity School alumni and other ministers. In 1964-65 three Seminars were held as follows: Columbia, S. C., in Washington Street Methodist Church (November 9-10, 1964); Greensboro, N. C., in West Market Street Methodist Church (January 18-19, 1965); and Fayetteville, N. C., in Hay Street Methodist Church (January 21-22, 1965). The subject presented in all three Seminars was "Current Interpretation of the New Testament."

Lecturers were Dr. Hugh Anderson, Professor of Biblical Criticism and Theology in the Divinity School of Duke University; Dr. Howard Clark Kee, Professor of New Testament in the Theological School of Drew University; and Dr. Krister Stendahl, the Frothingham Professor of Biblical Studies in the Divinity School of Harvard University.

Projected for 1965-66 are Seminars in Columbia, S. C., at Main Street Methodist Church (November 15-16, 1965); Gastonia, N. C., at First Methodist Church (January 17-18, 1966); and Goldsboro, N. C., at St. Paul Methodist Church (January 19-20, 1966). The subject in all three Seminars will be "Moral Responsibility and the Christian."

The lecturers in 1965-66 will be Dr. Hans Frei of the Department of Religion in Yale University; Dr. William H. Poteat, Associate Professor of Christianity and Culture in the Divinity School of Duke University; and Dr. Donald Shriver of North Carolina State College of the University of North Carolina, Director of the "Experimental Study of Religion and Society."

THE CLINIC IN PREACHING

The Eighth Annual Clinic in Preaching will be in session in the summer of 1965, between July 19th and 30th. Seminary graduates who have served in active ministry for 5 years or more are invited. The clinic will concern itself mainly with principles of sermon construction and delivery, giving ample opportunity for each member to preach for critique. Matters of theological and practical import for preachers will be discussed in informal sessions. The clinic is directed by Professor Thor Hall, assisted by other members of the preaching department faculty. No academic credit is given.

THE CLINIC IN PASTORAL CARE

The Clinic in Pastoral Care is offered under the direction of Professors Richard A. Goodling and Robert E. Smith and assisted by the Chaplains in the Medical Center and will be held July 19-July 30, 1965. Through lectures, group discussions, and hospital visitation experiences, explorations are made of the meaning of selfhood, the self in crisis, and the ministry to those caught in the crisis of illness. Registration is limited to twenty ministers of any denomination who hold the B.D. degree. No academic credit will be given.

THE RURAL CHURCH CLINIC

The Rural Church Clinic, to be held July 19-July 30, will consist of intensive training, study, and planning in the area of the church's responsibilities in the town and country community, giving particular emphasis to the development of an indigenous leadership. For registration information write to Professor M. Wilson Nesbitt, Director.

THE SCHOOL FOR SUPPLY PASTORS

In cooperation with the Department of In-Service Training of the Board of Education and the Southeastern Jurisdictional Conference of The Methodist Church, Professor W. A. Kale directs for the Divinity School a School for Supply Pastors of The Methodist Church and others taking the Methodist course of study for ministers. This school is in session for approximately four weeks each summer, and the required studies for one full year can be completed in this period. This is not a part of the regular work of the Divinity School and no credit toward a seminary degree can be earned. The faculty includes representatives from the Divinity School and other church-related institutions plus selected leaders of nearby Annual Conferences. The seventeenth session of the Supply Pastors' School is scheduled for July 12-August 6, 1965.

FACILITIES FOR ADVANCED STUDY IN THE AMERICAN SCHOOLS OF ORIENTAL RESEARCH

The Divinity School of Duke University is one of the supporting members of the American Schools of Oriental Research. Accordingly, students in the Divinity School have the privilege of attending the American School in Jerusalem or the one in Bagdad without charge for tuition. They may also compete for the financial aids which are offered annually by the Schools. These consist of four fellowships, the stipends depending upon available funds.

PROGRAMS IN PASTORAL CARE

Programs in Pastoral Care beyond the studies incorporated in the B.D. curriculum are provided in cooperation with the Duke Univer-

sity Medical Center, North Carolina Memorial Hospital in Chapel Hill, and Dorothea Dix Hospital in Raleigh. The staff for these programs consists of faculty members in Pastoral Care of the Divinity School and the Chaplains of the cooperating hospitals.
Five such special programs are available:

1. A quarter of Clinical Pastoral Training is available to a limited number of B.D. and post-B.D. students beginning the Monday nearest June 15 and continuing for twelve consecutive weeks. This quarter of training is accredited by the Institute of Pastoral Care, Inc.

2. The Master of Theology degree with a major in Pastoral Care is a calendar year program beginning June 15th, September 15th, or February 1st, and includes a summer quarter of clinical training full-time in one of the affiliated hospitals with such clinical training continuing on a half-time basis through the academic year. To the 14 credits the candidate receives for his clinical training are added 16 credits for coursework in The Divinity School. (See pages 41 and 42 of The Divinity School Bulletin for 1965-66 for general requirements for the degree and course work in Pastoral Care). Some tuition scholarship money is available and several traineeships are provided through the cooperating hospitals.

3. A one-year certificate or non-degree program is available for a limited number of candidates who hold the B.D. degree. These candidates are enrolled as Special Students in The Divinity School and may take a course or two each semester but the focus of their training is clinical.

4. A second or residency year is available for those men who have either the Master's degree in Pastoral Care or have completed an internship year. The residency may be taken at any one of the three cooperating hospitals. Fellowships are available.

5. A two-week clinic in Pastoral Care is provided each summer as part of The Divinity School's in-service training program. See p. 19.

For further information concerning any of these programs write to Dr. Richard A. Goodling, Director, Programs in Pastoral Care, The Divinity School.

Student Life

DIVINITY SCHOOL CHOIR

A student organization of long standing is the Divinity School Choir. Membership in the Choir is open to all qualified students. The Choir sings regularly for the daily services in York Chapel and at special seasonal programs and services. New members are chosen by informal auditions held during the first week of fall classes. Auditions are arranged for all who are interested.

THE COORDINATING COUNCIL FOR COMMUNITY LIFE

Beginning with the 1964-65 academic year the Student Government Association was superceded by a Coordinating Council for Community Life. This Council is composed of representatives from the student body, faculty, administration, Divinity Dames, and the doctoral students in religion.

The purpose of the Council is, as the name implies, to coordinate the activities of the Divinity School community. Realizing that there are many shared interests and concerns within the community which cannot be expressed fully in a student body organization alone, the Council was created by a joint student-faculty committee and approved by participating groups.

The shared interests and activities of the community are expressed through the several committees of the Council. The Council has coordinating, reviewing, and initiating powers in matters affecting the common life.

Student members of the Council are elected by the three B.D. classes, the M.R.E. candidates, the Th.M. candidates and the student pastors. A student activity fee is collected at the beginning of each academic year to support the activities of the community. The fee, in recent years, has been six dollars ($6.00). The funds are administered through committees and are spent on such projects as missions, social action, social events, and student publications.

DIVINITY DAMES

The wives of Divinity School students have an organization through which there is opportunity for informal fellowship during the period of the students' residency. For the past several years lecture courses, running for two-week periods in the fall and spring semesters, have provided instruction in various aspects of parish life

and in theological and Biblical subjects and issues. The Dean and faculty are concerned to assist the wife to understand her husband's vocation and to participate appropriately.

STUDENT PUBLICATIONS

In cooperation with the Dean's Office, students publish a faculty and student *Directory*. A monthly paper entitled *Response* is published under their editorship.

Admission and Requirements for Degrees

Requirements for Admission

THE Divinity School is a fully accredited member of the American Association of Theological Schools, and is one of twelve accredited seminaries of The Methodist Church. Candidates for admission must hold the degree of A.B., or its equivalent, based upon four years of work beyond secondary education, in a college which is approved by one of the regional accrediting bodies, and their college records must be such as to indicate their ability to carry on graduate professional studies. They will be admitted without examination on presentation of an official, satisfactory transcript of college and all other academic credits which they may have secured. Recommendations from five responsible persons are required. Women will be admitted on the same basis as men.

Applications are evaluated with a view both to the academic achievement of the candidate and with reference to his personal and professional qualifications for the Christian ministry. While an academic average of less than "B—" is ordinarily regarded as a disqualification for admission, nevertheless, the Committee on Admissions is impressed with a rising curve of achievement in the undergraduate program and makes its decision on the basis of the whole body of credentials of an applicant, including supporting letters of reference.

The applications of students from foreign countries will be considered, each on its own merits, the general principle being that training equivalent to that of a baccalaureate degree from an accredited American college must have been secured.

In addition to an adequate academic preparation, applicants must satisfy the Faculty as to their Christian character and purpose. A formal application blank may be secured from the office of the Divinity School. This must be filled out and returned by all candidates for admission. Applications received after May 1 cannot be assured of admission, financial aid or dormitory rooms for the ensuing academic year. *A minimum of thirty days is required to process any application, in many cases longer.*

All persons admitted to the Divinity School are required to report to the Student Health Service, Duke Hospital, for physical examina-

tion on days and at hours specified at the time of matriculation. No admission is final until approved by the Student Health Service, which requires a certificate of immunization and general health to be submitted not earlier than July 1 and not later than August 1. Applicants are also required to take certain tests administered by the Bureau of Testing and Guidance and by the Theological School.

Persons who do not matriculate at the time for which they were originally admitted forfeit admission and must be formally readmitted. A student who withdraws from the Divinity School and desires to return at a later date must file with the Dean a written request for a leave of absence.

Applicants are required on notification of admission to signify their acceptance within three weeks, and to pay an admission fee of $30.00. (Make check payable to Duke University and send to the Office of the Dean of the Divinity School.) This fee is applied to the regular first-term bill if the student matriculates; if he fails to do so, the fee is forfeited. This does not apply to the Summer Session.

Under the terms of the Selective Service Act, as it now stands, pre-enrollment for later formal admission may be granted to persons who meet the Divinity School standards and requirements for admission. Applications for pre-enrollment may be addressed to the Office of the Dean. Pre-enrolled students must send transcripts of each year's college work by June 15th of each year in which they are pre-enrolled. *Pre-enrollment does not guarantee final admission,* and a person who has been pre-enrolled for any length of time must send a transcript of work by February 1 of the year in which admission is sought. This must be accompanied by a letter from the college dean or other approved reference certifying to continued academic acceptability, good character and conduct.

PRE-SEMINARY CURRICULUM

The Divinity School, in substantial agreement with the standards of the American Association of Theological Schools, recommends that prospective candidates for admission keep in mind the desirability of including the following in their undergraduate curriculum:

It is suggested that a student should acquire a total of 90 semester hours or complete approximately three-fourths of his college work in the areas listed below. No work done towards a first college degree may be used toward a Divinity School degree.

Basal Fields	*Semesters* (At least the number indicated)
English	6
Literature, composition and speech, and related studies	
History, ancient, modern European, and American	3
Philosophy, orientation in history, content and method	3
Religion	3
Psychology	1
A foreign language	4
Greek, Latin, Hebrew, French and German are especially recommended.	
Natural Science	2
Fundamentals of Speech	1

TRANSFER OF CREDIT

Transfer of credit from theological schools accredited by the American Association of Theological Schools is provided for by the Faculty of the Divinity School under certain conditions. Applications for transfer of credit will be ruled upon by the Committee on Admissions, and will be subject to evaluation in terms of the prevailing requirements of the Divinity School for graduation. *Ordinarily, credit from another institution will not be granted in amount exceeding one-half of the total credits required by the Divinity School for graduation.* A student applying for transfer of credit in excess of this amount may be required to pass such examinations as the Committee on Admissions may prescribe. In each case a letter of honorable dismissal from the school from which transfer is made is required along with transcript of academic credits.

ADVANCED STANDING

Advanced standing allows entering students to begin work in any given field at a level higher than that of the core curriculum, or to substitute a specialized or cognate course for a core requirement.

Entering students with substantial undergraduate preparation in areas closely related to required courses of the Divinity School core curriculum may be eligible for advanced standing. While a student may be eligible for advanced standing in any subject, it is especially pertinent where students offer undergraduate majors of superior quality in Bible, religion, or philosophy. Students entering with six or more semester hours in the Greek language should consult the catalogue under "Language Study" for a description of special privileges pertaining to their case. The fields in which entering students, by virtue of previous undergraduate study, are most likely to qualify for advanced standing are: Old Testament, New Testament, Types of Religious Philosophy, Church History.

An entering student who offers not less than *six* semester hours of college credit, with a grade of "B" or better in one or more of these areas may ordinarily anticipate advanced standing in corresponding required courses of the Divinity School core curriculum. All final transcripts will be studied, and advanced standing will be accorded to those who qualify under this provision.

A student who offers not less than three semester hours of college credit with a grade of "B" or better in one or more of these areas may, for satisfactory performance in a qualifying examination in the discipline, be granted advanced standing. Entering students who qualify, under this provision must, at the time of application, make request for the privilege of sitting for such an examination.

The core requirement for the entering, or junior student, with

advanced standing is ordinarily satisfied by one of the following substitutions:

For Old Testament 11: O.T. 101; 106 A, B, C, D; 196; 201; 202.
For New Testament 18: N.T. 103; 104; 105; 109; 116 A, B, C; 117 A, B; 225.
For Types of Religious Philosophy: C.C. 16.
For Church History 13: C.H. 137; 138; 331; 332.
For Church History 14: C.H. 85; 250; 330.

ADMISSION ON PROBATION

1. Applicants for admission who are graduates of non-accredited colleges will be considered on their merits. Ordinarily, such applicants must show that they have attained a superior average for a four-year college course.

Admission of such persons will, in every case, be *on probation*.

2. Applicants for admission who are graduates of accredited colleges but whose college transcripts do not fully meet Divinity School standards may be admitted *on probation* if their recommendations otherwise justify admission.

Probation means:

a. Students who, during the first year of Divinity School work maintain less than a "C" average, including one or more failures, ordinarily will be required to withdraw from the School.

b. Students admitted on probation may carry only limited schedules of work, the amount to be determined by the Dean of Students.

c. A student admitted on probation ordinarily shall not be admitted for advanced standing.

Students whose work after admission is not satisfactory may be placed on probation.

MINISTERIAL AND PROFESSIONAL QUALIFICATIONS

All students who are admitted to academic study in The Divinity School are subject to the established order of administrative regulations of the University and the accepted standards of personal conduct it enjoins; continuance in the School is conditioned upon acknowledgment of and compliance with such regulations and standards.

In particular, the University and the Divinity School expect and require students in candidacy for degrees, leading to a ministerial vocation, not only to exemplify the dignity of their calling, but to exhibit attitude and conduct conformable with the recognized standards of their Christian profession. While no "honor system" relating to academic integrity is formalized within the Divinity School, application for and admission to course of study assume the student's

assent to full compliance with recognized standards of integrity in the fulfillment of academic tasks.

On this prior understanding, therefore, the University reserves the right, and matriculation by the student is a concession to this right, to compel the withdrawal of any student whose conduct at any time is not satisfactory to the University, even though no specific charge is made against the student.

As a graduate professional school of theology, the Divinity School expects, on the part of the student, an increasing manifestation of maturity and professional purposiveness in discharge of personal and academic responsibilities appropriate to the level of advanced academic work leading to the high and exacting demands of the Christian ministry. Since personal and professional qualifications for the ministry will be considered in evaluating the candidacy of all students for degrees, students whose persons, progress, or development indicate that they are not suited to the work of the ministry will not be allowed to continue in the School.

FACULTY ADVISERS

Each entering student is assigned to a Faculty Adviser at the time of registration and must report to his Adviser. A student must consult with his Adviser in order to determine his course and cannot complete his registration without the signature of his Adviser. It is understood that all students will continue to consult their advisers at the time of registration throughout the period of their academic work.

ENGLISH DEFICIENCY

Students whose English testing scores show marked deficiency or who are reported by their instructors as deficient in English usage will be required to take Remedial English in addition to meeting other requirements for the Bachelor of Divinity degree.

SPEECH DEFICIENCY

At any time in his academic course—on evidence of deficiency in the fundamentals of speech, such as voice or diction—a student may be required to enroll for Speech 34, Workshop in Communication.

Advanced standing does not apply to Professional Courses listed as requirements for Vocational Groups.

Requirements for Degree of Bachelor of Divinity

Course requirements are of three kinds: Those of the core curriculum, professional courses, and practicums related to field work. Courses of the core curriculum are required of all students; the professional courses required vary with the prescription of the five Vocational Groups. Practicums are required of students engaged in regular or summer field work.

REQUIREMENTS FOR THE JUNIOR YEAR

1. Courses of the Core Curriculum.

O.T. 11.	Introduction to the Old Testament I	3 s.h.
C.H. 13.	History of the Church to the Protestant Reformation	3 s.h.
C.H. 14.	History of Modern European Christianity	3 s.h.
N.T. 18.	Early Christian Life and Literature	3 s.h.
*T.S. 20.	Types of Religious Philosophy	3 s.h.
H.T. 21.	Theology of the Protestant Reformation	3 s.h.

2. Professional Courses.

P.S. 10.	I. The Church and the Minister's Vocation	1 s.h.
P.C. 26.	II. Introduction to Pastoral Care	3 s.h.
C.W. 40.	VII. The Church at Worship	3 s.h.

Required of all students of the Junior Year

3. Field Work Practicums.

Field Work Practicum I (For Student Pastors)	1 s.h.
Field Work Practicum II (For Summer Endowment)	1 s.h.

REQUIREMENTS FOR THE MIDDLER YEAR

1. Courses of the Core Curriculum.

O.T. 12.	Introduction to the Old Testament II	3 s.h.
N.T. 19.	Introduction to New Testament Theology	3 s.h.
†W.C. 24.	Philosophy of the Christian World Mission	2 s.h.
C.E. 27.	Christian Ethics	3 s.h.
A.C. 28.	History of American Christianity	3 s.h.
C.T. 32.	Christian Theology I	3 s.h.
C.T. 33.	Christian Theology II	3 s.h.

2. Professional Courses.

Pr. 29.	III Sermon Construction—Theory	2 s.h.
Pr. 30.	V Sermon Construction—Practice	1 s.h.

Professional Courses III and V required of all students in Vocational Groups I, III, IV, VI, and, on occasion, II.

REQUIREMENTS FOR THE SENIOR YEAR

I. Professional Courses.

C.Ed. 22.	IV Theology and Christian Nurture	3 sh.
C.P. 23.	VI The Care of the Parish	3 s.h.
Pr. 31.	VIII Preaching (practice)	1 s.h.

Professional Course IV required of all students in Vocational Groups, I, II, III, and VI. Professional Course V required of all students in Vocational Groups I, III, IV, V, VI, and, on occasion, II.

* Advanced Standing entitles the student to elect C.C. 16 *Contemporary Western Culture.*
† Required of Vocational Groups I, II and III.

Professional Course VI is required of students in Vocational Groups I, II, and IV.

Professional Course VII is required of students in Vocational Groups I, II, III, IV, and VI.

Professional Course VIII is required of students in Vocational Group I.

II. Vocational Groups.
Each student, not later than the end of the junior year, shall choose one of the six Vocational Groups listed on pages 33 to 35 and will meet the vocational requirements of the group chosen.

III. Vocational Qualifying Finals.
Each senior student shall complete his academic program during his senior year by registering for and fulfilling the requirements of the qualifying final discipline pertaining to his chosen vocational group. For description see page 35.

IV. Free Electives.
The student will choose a sufficient number of courses to make up the total of 90 semester hours required for graduation. Language courses count as free electives.

V. English Bible. A knowledge of the content of the English Bible requisite to the discharge of the teaching and preaching task of the Christian ministry is required and will be tested. Such proficiency must be demonstrated by the end of the student's senior year. Successful completion of Old Testament English Bible I and New Testament English Bible II (see pp. 43, 44) fulfill this requirement. A student may, however, sit for the final examinations in these courses and by passing them fulfill the requirement, in which latter case he receives no academic credit.

Suggested Distribution by Semesters of Required Courses

FIRST (JUNIOR) YEAR

First Semester	*Semester Hours*
Required in this Semester	
10. I The Church and Minister's Vocation	1
11. Introduction to the Old Testament I	3
13. History of the Church to the Protestant Reformation	3
18. Early Christian Life and Literature	3
20. Types of Religious Philosophy*	3
Field Work Practicum I (Student Pastors)	1

Second Semester	*Semester Hours*
Required in this Semester	
14. Modern European Christianity	3
21. Theology of the Protestant Reformation	3
26. II Introduction to Pastoral Care	3
Field Work Practicum II (Summer Field Work)	1
40. VII The Church at Worship	3

15 hours is the normal program, not over 16 hours may be scheduled in either semester.
*Students with Advanced Standing may enroll in C. C. 16, *Contemporary Western Culture.*

SECOND (MIDDLER) YEAR

First Semester	*Semester Hours*
Required in this Semester	
19. Introduction to New Testament Theology	3
24. Philosophy of the Christian World Mission†	2
28. History of American Christianity	3
29. III Sermon Construction—Theory	2
32. Christian Theology	3

Second Semester	*Semester Hours*
Required in this Semester	
12. Introduction to the Old Testament II	3
27. Christian Ethics	3
30. V Sermon Construction—Practice	1
33. Christian Theology	3

Professional Courses I and II required of all students.
Professional Course III, required of Vocational Groups 1, 3, 4, 6, and on occasion 2.
Professional Course V, required of all students in Vocational Groups 1, 3, 4, and 6, and on occasion 2.
†Required of students in Vocational Groups 1, 2, 3.

THIRD (SENIOR) YEAR

First Semester	*Semester Hours*
22. IV Theology and Christian Nurture	3
C.P. 23. VI The Care of the Parish	3
Pr. 31. VIII Preaching (Practice)	1

Professional Course IV, required of all students in Vocational Groups 1, 2, 3, and 6.

Schedule of Required Courses

FIRST YEAR—FIRST SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		N. T. 18	N. T. 18	P. S. 10	N. T. 18	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		C. H. 13	Assembly	C. H. 13	C. H. 13	
12:00	C. C. 16 T. S. 20		C. C. 16 T. S. 20		C. C. 16 T. S. 20	
2:00	O. T. 11	†Practicum	O. T. 11		O. T. 11	
3:00						

FIRST YEAR—SECOND SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		C. H. 14	C. H. 14		C. H. 14	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		VII C.W. 40	Assembly	VII C.W. 40	VII C.W. 40	
12:00						
2:00	H. T. 21	‡Practicum	H. T. 21		H. T. 21	
3:00	II P. C. 26		II P. C. 26		II P. C. 26	

†For Student Pastors, additional sections of Practicum are available.
‡For Duke Endowment Students, additional sections of Practicum are available.
Professional Courses I and II required of all students.

SECOND YEAR—FIRST SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		C. T. 32	C. T. 32		C. T. 32	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		A. C. 28	Assembly	A. C. 28	A. C. 28	
12:00		III Preaching 29		III Preaching 29		
2:00	N. T. 19	W. C. 24	N. T. 19	W. C. 24	N. T. 19	

SECOND YEAR—SECOND SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10		C. T. 33	C. T. 33	V Preaching 30	C. T. 33	
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		C. E. 27	Assembly	C. E. 27	C. E. 27	
12:00						
2:00	O. T. 12		O. T. 12		O. T. 12	

THIRD YEAR—FIRST SEMESTER

Hour	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
8:10						
9:10						
10:10		Chapel	Chapel	Chapel	Chapel	
11:00		IV C. Ed. 22	Assembly	IV C. Ed. 22	IV C. Ed. 22	
12:00		VI C. P. 23	VIII Pr. 31	VI C. P. 23	VI C. P. 23	
2:00						

VOCATIONAL GROUPS

In recognition of the existing and growing diversity of function within the 20th century Protestant Christian ministry, the program of studies leading to the B.D. degree has been designed to afford variability of emphasis within a basic unity. The core curriculum of basic theological studies provides uniform requirements for all. Variability of emphasis derives from the carefully tailored requirements peculiar to each vocational group. Election of a vocational group is election of a cluster of required courses regarded as providing adequate conversancy with a range of subject matter most pertinent to the special emphasis of the vocational group.

Each student shall choose his vocational group during the second semester of his first or Junior year and give notice of his choice to the office of the Dean of Students not later than May 1.

The student is urged to consult his faculty adviser in making his selection of a vocational group. Students electing Vocational Group I will be certified for that group by the Dean of Students. Students electing Vocational Group II shall have the approval of Professor Kale; those electing Vocational Group III, the approval of Professor Lacy; those electing Vocational Group IV, the approval of Professor Goodling. Students electing Vocational Group V shall have the approval of the Dean and must offer an average of "B minus" for the academic record of their junior year. Students electing Vocational Group VI must have the approval of the Dean of Students. Choice of a vocational group is regularly subject to review of the Dean, and the right to require alteration of election is reserved.

A qualifying final discipline is attached to each vocational group and constitutes a requirement for graduation. Open to students in their senior year, it carries two semester hours credit. See page 35.

Electives in sufficient amount to complete 90 hours for graduation will be taken.

I. THE PARISH MINISTRY

A student electing Vocational Group I shall plan his program to include one course at a level higher than the core requirement from six of the following areas:

Biblical Studies
Care of the Parish
Christian Education
Historical Studies
Pastoral Care
Church at Worship
Theological Studies

This Vocational Group requires the following Professional Courses: III, IV, V, VI, VII, VIII, and Philosophy of Christian World Mission.

II. THE MINISTRY OF CHRISTIAN EDUCATION

A student should plan his courses so as to include three of the following Christian Education courses: 125, 126, 161, 162, 169 and at least one course from among the following: 164, 165, 166. In addition the student should take one advanced course in each of the following fields: Christian Theology, Biblical Studies, American Christianity, Historical Theology or Church History, Christian Ethics, Pastoral Care, and Worship.

This Vocational Group requires the following Professional Courses: IV, VI, VII, and Philosophy of Christian World Mission.

Those students planning to pursue the Ministry of Christian Education within the Parish Ministry may also in certain circumstances be advised to take Professional Courses III and V.

III. THE MINISTRY OF MISSIONS

The student should plan his course so as to include the following courses in Missions and related subjects: W.C. 24, 133, and 156, H.R. 158, C.E. 190. In addition he should take at least one advanced course in Biblical Studies; and one in Christian Theology or Historical Theology; and at least one of the following courses, depending on his field of anticipated service: H.R. 179, 180, 182, or C.T. 213 (with appropriate substitutions if these are not offered).

Professional Courses III, IV, V, and VII are required of this group.

IV. THE MINISTRY OF PASTORAL CARE

In addition to the required course in Pastoral Care, P.C. 26, the student should plan his program so as to include the following: P.C. 170; 171 or 172; 177; 174 or 188; C.T. 125 or T.S. 102; H.T. 121 or one advanced course in Church History. Students must also take one advanced course in *each* of the following areas: Christian Theology; Christian Ethics or Christianity and Culture; Biblical Studies.

Professional Courses III, V, VI*, and VII are required of this group.

V. THE MINISTRY OF TEACHING

A student electing Vocational Group V shall declare his major during the second semester of his first or junior year and shall select for concentration five of the areas listed below of which one shall be the designated major in which he shall take not less than nine semester hours. He shall in addition, ordinarily, take not less than five semester hours in each of the other four areas. Normally, the above requirements are met by courses of advanced level; however, introductory courses of the Core Curriculum, not already taken as standard requirements of the Junior and Middler years may be included as fulfilling the major and minor areas of study.

American Christianity
Christian Education
Christian Ethics
Christianity and Culture
Church History
Historical Theology
History of Religions and World Christianity
New Testament
Old Testament
Theology and Philosophy of Religion

Professional Courses III and V (or IV and VII).

VI. THE MINISTRY TO THE CAMPUS

Students electing this group are required to take at least one advanced course in Christianity and Culture, and one advanced course in Pastoral Care. They are also required to take C.Ed. 149. In addition, they are advised to select electives in consultation with the director of Vocational Group VI in such fashion to maintain balance between the several disciplines.

Students of this group are required to serve an apprenticeship which may be accomplished in either of two ways:

1. A student may work part-time for one academic year as commuting active staff member of a denominational college chaplaincy program currently operating on one of the campuses within a fifty-mile radius of Duke University. Specific assignments and terms of employment as permitted by the academic load of the students would, in such cases, be arrived at in consultation with the director of Vocational Group VI and the Dean of Students.

2. A student may apply to an appropriate foundation (or other comparable agency) for grant to work full time for a year as a Seminary intern in a college campus situation and, if he is awarded such a grant, fulfill in this way the apprenticeship requirement. Students of Group VI are encouraged to apply for such a grant before proceeding otherwise.

* C.Ed. 161 or 162 may be substituted for Professional Course VI.

A student's association as intern or member of chaplain's staff will be recorded on his transcript. Regular reports of the student's activity and performance are to be made by the student and by his immediate supervisor during the term of his work as intern or staff member.

Professional Courses III, IV, V, and VII are required of this group.

SENIOR VOCATIONAL QUALIFYING FINALS

Each student must, as a requirement for graduation, complete the qualifying discipline of his chosen Vocational Group as described below:

For Vocational Group I: On the basis of Biblical materials designated by instructors and developed according to method and standards described in exemplary lectures given by a faculty panel, a student of this group is to provide the following: (a) a complete, written exegesis of an assigned Biblical text, (b) a written explanation of the theology implicit and explicit in the passage, together with a written statement of his credo regarding the theology discussed, and (c) the manuscript of an expository sermon embodying the exegetical insights and theological position set forth in (a) and (b).

For Vocational Groups II and III: A student of either of these groups presents to a specified committee of the faculty an essay on an assigned subject. For credit the essay must, in the opinion of the committee, demonstrate the relation of the student's choice of particular field to his total program of study.

For Vocational Group IV: Each student electing this group must complete the seminar in the Theology of Pastoral Care, staffed by an interdisciplinary committee of the faculty, and present to the committee a paper on an assigned subject during the course of the seminar.

For Vocational Group V: A student of this group must take a seminar involving coalition between at least two of the disciplines of historical, Biblical, and theological studies. Opportunity and responsibility for conducting class sessions through reports, discussion-direction, and consultation will afford distinctive experience in the teaching situation.

For Vocational Group VI: Students of this group are not required to take a qualifying final but must fulfill the demands of an apprenticeship described above.

Students of Groups I and V normally fulfill the above requirements during their fifth or sixth semester of residence. Students of Groups II and III normally receive assignments early in the fifth semester of residence and complete the assignment before graduation, although the date by which assignments must be completed may be set at the discretion of the student's committee. Students of Group IV normally take their seminar in the sixth semester of residence. The qualifying discipline for each group carries, when successfully completed, two semester hours' credit.

ADMINISTERING THE CURRICULUM

For the administration of the curriculum the following regulations have been adopted:

Full-time students must take the required courses as specified for the respective semesters.

The schedules of all students are subject to review and approval of the Dean and the Committee on Academic Standing.

Students in candidacy for the B.D. degree who accept student pastorates are advised that their program of study will require a fourth year. Students with pastoral charges will enroll for not less than eight nor more than twelve semester hours in any given semester.

Ordinarily, a student enrolled in candidacy for the B.D. or M.R.E. shall enroll for no less than eight semester hours in any semester.

Not over 30 semester hours of Summer Session work may be credited toward the degree of Bachelor of Divinity.

The status of "special student" may not be granted simply to permit avoidance of the schedule of required courses. Every request for this classification will be carefully investigated and approval of the Dean is required.

A fee of $15.00 is charged for auditing any course except where a student is already paying regular University fees. Permission to audit requires the approval of the Dean and the instructor concerned.

Student pastors and students working under the Duke Endowment Summer Field Work program of the Rural Church, are required to take one of the Field Work Practicums.

LANGUAGE STUDY

A student who takes six hours of N.T. language may be excused from either N.T. 18 or N.T. 19; one who takes six hours of O.T. language may be excused from either O.T. 11 or O.T. 12, depending on the year in which he takes Hebrew.

A part-time student who desires to begin the study of Greek in the first year may postpone the required course in Old or New Testament.

For a student planning to take both Greek and Hebrew: the Greek may be continued in the second year by postponing N.T. 19 in the fall semester and waiving O.T. 12 in the spring semester.

Suitable entry will be made on the permanent record of any student who is granted permission to deviate from the requirements in the matter of language.

GRADUATION CREDITS

It is the responsibility of each student to see that he meets all requirements for graduation, and to take his courses in proper sequence.

He is also responsible for seeing that any special permission granted him to deviate from the normal program is properly recorded in his personal files. Deviations from a normal academic program must be approved by the Dean of Students as representative of the Dean of the Divinity School.

GRADING SYSTEM

The grading system of the Divinity School employs the letters A, B, C, D, and F, which have been defined as follows: A = Excellent; B = Superior; C = Average; D = Inferior; F = Failure; WP = Withdrew Passing; WF = Withdrew Failing; WI = Withdrew Illness and I = Incomplete; P, Passed. (See below.) No percentage equivalents are stated. A student is expected to maintain an average of C.

In all courses where the instructor considers attendance a necessary part of the work of the course, a student may not receive a grade of over C if his absences total 12% of the regular class periods, and if the absences total 24% of the class periods he may not receive credit for the course.

INCOMPLETES

A student may, with the permission of the instructor concerned, petition the Dean of Students to receive a grade of "incomplete" in a course. Such permission may be granted when a student, through some circumstance beyond his control, such as illness, has been hindered from meeting the course requirements. No "incomplete" is recorded without permission in writing from the Dean of Students. Ordinarily, an "incomplete" will not be approved in the case of students completing their academic work in the fall semester. An "Incomplete" automatically becomes an "F" unless it is removed through completion of assigned work by the following dates:

For "Incompletes" incurred in fall semester courses, March 15, following

For "Incompletes" incurred in spring semester courses, October 15, following

For "Incompletes" incurred in summer courses, October 15, following.

CHANGE OF COURSE OR WITHDRAWAL

A student is permitted to change his registration for course work without incurring a penalty no later than completion of the second meeting of the course from which he desires to withdraw or, correspondingly, of the course to which he seeks admission. All such changes shall be approved by a member of the Registration Committee.

No student shall be permitted to drop a course after the expiration of one-third of the period of instruction of the course without incurring failure, except for causes adjudged by the Dean or Dean of Students to be beyond the student's control. Conditions of emergency and not considerations of convenience shall be regarded as determinative in considering requests.

GRADUATION WITH DISTINCTION

Students who achieve a grade point average of 3.75 (A, 4; B, 3; C, 2; D, 1) for over-all academic record in the Divinity School are granted the degree of Bachelor of Divinity, *summa cum laude.* Students with a grade point average of 3.5 are awarded the degree, *magna cum laude.* Such distinction is specified on their diplomas.

Requirements for the Degree of Master of Religious Education

THE course of study leading to this degree is designed for persons desiring to engage in various forms of Christian Education.

Candidates for this degree must hold the degree of A.B. (or its equivalent), based upon four years of work beyond secondary education, in a college which is approved by one of the regional accrediting bodies, and with academic and personal records which afford promise of competence in this area of service. The course of study will be especially useful for individuals who have had one or more years of experience in Christian Education and desire further training. Candidates for this degree will be limited in number, and individuals interested are urged to apply for admission well in advance of the opening of the academic year. All work offered for this degree, whether in the regular year or in summer sessions, must be completed within a period of six years from the date of beginning.

It is desirable that each applicant for admission show a "B" average in his college work. An applicant must show a college average of not less than "B—."

PREREQUISITES

Three of the following five prerequisite studies must have been taken by the candidate prior to his admission to the Divinity School or must be secured, without credit toward the M.R.E. degree, after being admitted:

General Psychology	3 s.h.
Sociology	3 s.h.
Education	3 s.h.
Philosophy	3 s.h.
Religion	3 s.h.

GENERAL REQUIREMENTS

Sixty semester hours of graduate-professional work are required for graduation. Not more than twelve semester hours of this work may be taken in approved summer sessions.

No credits are allowed for undergraduate courses. However, in approving plans of study leading to this degree, consideration will be given to earlier work taken in the fields of Biblical studies and Christian Education provided such courses were taken in the Junior

and Senior years in accredited four-year colleges. Also, where candidates for the degree have been engaged professionally as Directors of Christian Education for not less than twelve months prior to entering the Divinity School the amount of Field Work may, upon recommendation of the Director of the M.R.E. program and the approval of the Dean, be reduced to not less than three hours of Project or Directed Field Work during the period required for completing requirements for the degree.

A student who secures credit for 15 semester hours each semester will be in line for graduation at the end of two academic years. The amount of work allowed in each semester may not exceed that permitted in the B.D. curriculum.

Candidates must also pass the English Bible examinations or equivalent described under requirements for the B.D. degree. Normally these examinations are taken in the second year of the M.R.E. program, but, with permission of the Director of the M.R.E. program, may be taken during the student's first year of residence.

COURSE REQUIREMENTS FOR THE M.R.E. DEGREE

Subject	*Required Semester Hours*
Biblical Studies (O.T. and N.T.)	9 to 12
Church History, Historical Theology and American Christianity	9 in two or more of these fields
Christian Theology	3 to 6
Philosophy of Religion or Christian Ethics	3
Worship	3
Pastoral Care	3
Christian Education (including missionary education)	11
Christian Education Practicum	3
Required Hours	44 to 50
Electives	10 to 16
TOTAL	60

Requirements for the Degree of Master of Theology

THE course of study leading to the degree of Master of Theology is designed for graduates of accredited theological schools who desire to continue or resume their theological education for enhancement of professional competence in selected areas of study. Enrollment in the Th.M. program is open to a limited number of students who have received the B.D. (or the equivalent) with superior academic records.

GENERAL REQUIREMENTS

The general requirements for the degree of Master of Theology are:

(1) thirty semester hours of advanced studies, with a minimum grade of "B" in each course;

(2) superior performance in a comprehensive examination covering the major and minor areas of study;

(3) residence for one academic year.

There are no general language requirements, but classical or modern languages may be required for certain courses (for example, Hebrew or Greek in Biblical studies).

THE PROGRAM OF STUDY

At least twelve of the required thirty hours must be taken in one of the basic divisions of study (Biblical, Historical, Theological, or Professional) which shall be designated as the candidate's major; and at least six hours in another of the divisions which shall be designated as the candidate's minor. No more than twelve hours may be taken in summer sessions. No more than six semester hours of work completed in another accredited institution may be transferred and credited toward the degree. Ordinarily, no more than six hours may be taken through directed reading, and no more than three in any one semester or summer term. In the area of Pastoral Care, up to fourteen hours may be taken through clinical training.

The major in Pastoral Care requires a calendar year. The candidate normally begins his training June 15 with 12 weeks of full-time clinical training.

Each student will plan his program of courses and directed reading or clinical training with the guidance of a committee of two to be appointed by the Director of the Master's Program. The committee will include a professor in the student's major area of interest, who will act as chairman, and a professor in the minor area. The chairman, in consultation with the Director and the other member of the committee, will prepare, administer, and evaluate the comprehensive examination.

The comprehensive examination will be given at the close of the course of study for the degree, ordinarily in May or September.

The entire program of studies and comprehensive examination should be completed within twelve months. In exceptional cases, the time limit may be extended, but in no case beyond three years.

Courses of Instruction*

REQUIRED courses are numbered from 10 to 70. Elective courses carrying credit in the Divinity School only are numbered from 71 to 199. Courses approved for credit in both the Divinity School and the Graduate School of Arts and Sciences are numbered above 200. Lists of courses to be offered in any semester will be available at the time of each registration.

I. Biblical Studies

OLD TESTAMENT

OLD TESTAMENT ENGLISH BIBLE I. (Meets two hours weekly.) 1 s.h. MR. EFIRD

11. INTRODUCTION TO THE OLD TESTAMENT I.—The origin, literary forms, and contents of the books of the Old Testament in their geographical and historical setting on the Exile. 3 s.h. MR. EFIRD

12. INTRODUCTION TO THE OLD TESTAMENT II.—Introduction to and interpretation of Exilic and post-Exilic prophecy, Psalms, wisdom literature, the Chronicler, apocalyptic, and the Apocrypha. 3 s.h. MR. STRUGNELL

101. POST-EXILIC PROPHECY.—A study of the post-Exilic prophets from Ezekiel to Daniel, with special reference to Messianic prophecy and related theological problems. 2 s.h. MR. STRUGNELL

106. EXEGESIS OF THE ENGLISH OLD TESTAMENT.—A. A book of the Pentateuch; B. A prophetical book; C. A historical book; D. Selected poetical materials. (O.T. 106 A, O.T. 106 B, O.T. 106 C, and O.T. 106 D are separate courses offered in different semesters.) Prerequisite: O.T. 11 or the equivalent. 2 s.h. STAFF

196. THE BIBLE AND RECENT DISCOVERIES.—A survey of the contribution of the cultural setting of the Bible as an aid to its understanding. 3 s.h. MR. STRUGNELL

201-202. FIRST HEBREW.—The principles and structure of the Hebrew language with translation of selected Old Testament narratives. One year of Greek prerequisite. 6 s.h. MR. EFIRD

207. SECOND HEBREW.—Historical Hebrew grammar with reading and exegesis of Old Testament prose (Pentateuch and historical books in alternate years). First semester. 3 s.h. STAFF

208. SECOND HEBREW.—Historical Hebrew grammar with reading and exegesis of Old Testament poetry (Prophets and the Writings in alternate years). Second semester. 3 s.h. STAFF

209. BIBLICAL THEOLOGY.—A study of the Old and New Testaments in regard to their theological relationship. Prerequisite: O.T. 11 and N.T. 19. 3 s.h. MR. ANDERSON

301. THE THEOLOGY OF THE DEAD SEA SCROLLS.—A study of the religious ideas of the Scrolls in relation to the theology of the Old and New Testaments. Prerequisite: O.T. 11. 3 s.h. MR. STRUGNELL

* On approval of the Dean, courses offered in the Graduate School of Arts and Sciences other than those approved for credit in the Divinity School may be approved for credit in individual cases, provided no equivalent course is offered in the Divinity School; each case to be decided on its merits.

302. STUDIES IN THE INTERTESTAMENTAL LITERATURE.—Selected documents of the Apocrypha and Pseudepigrapha examined exegetically and theologically in their relation to post-Exilic Judaism. Prerequisite: Permission of the instructor. 3 s.h. MR. ANDERSON

304. ARAMAIC.—A study of the Aramaic portions of the Old Testament, and selected passages from the Targums, Midrashes, and Talmuds. 3 s.h. MR. STINESPRING OR MR. STRUGNELL

305. THIRD HEBREW.—An interpretative study of late Hebrew prose, with readings from Chronicles, Ecclesiastes, and the Mishnah. 3 s.h. MR. STINESPRING

306. LANGUAGE AND LITERATURE OF THE DEAD SEA SCROLLS.—A study in interpretation. Prerequisite, a knowledge of Hebrew. 3 s.h. MR. STRUGNELL

307. SYRIAC—A study of the script and grammar, with readings from the Syriac New Testament and other early Christian documents. Some knowledge of Hebrew and Aramaic prerequisite. 3 s.h. MR. STINESPRING

309. HISTORY OF THE ANCIENT NEAR EAST.—A specialized study of the civilizations of Egypt, Palestine, Syria, and Mesopotamia in the light of Biblical archaeology. 3 s.h. MR. STINESPRING

310. OLD TESTAMENT PROPHECY.—The prophetic movement in Israel with special emphasis on the theological standpoint of the prophets of the eighth century B.C. Prerequisites: O.T. 11 and O.T. 12. 3 s.h. MR. STINESPRING

*HISTORY OF ART 215. RELIGIOUS ART OF THE ANCIENT NEAR EAST.—The development of art, particularly architecture and sculpture, as the material expression of religious ideas in Egypt, Mesopotamia, and in part Syria and Palestine to the Persian conquest. 3 s.h. MR. MARKMAN

*HISTORY OF ART 216. RELIGIOUS ART OF THE CLASSICAL WORLD.—The religious art, particularly architecture and sculpture, of Greece and Rome with special emphasis on the monuments in the Near East. 3 s.h. MR. MARKMAN

NEW TESTAMENT

NEW TESTAMENT ENGLISH BIBLE II. (Meets two hours weekly.) 1 s.h. MR. EFIRD

18. EARLY CHRISTIAN LIFE AND LITERATURE.—A basic study of the civilization in which Christianity began; the origin and development of the Christian Church and its literature through the second century. 3 s.h. MR. SMITH

19. INTRODUCTION TO NEW TESTAMENT THEOLOGY.—A constructive analysis and exposition of the positive doctrinal content of the New Testament. Prerequisite: N.T. 18. 3 s.h. MR. ANDERSON

103-104. HELLENISTIC GREEK.—Designed for beginners to enable them to read the Greek New Testament. 6 s.h. (Two sections) STAFF

105. STUDIES IN PAUL.—An investigation of Paul's apostolate based upon the Acts and the Epistles with attention to Paul's theology as reflected in selected passages. 3 s.h. MR. EFIRD

116. EXEGESIS OF THE ENGLISH NEW TESTAMENT I.—A. Luke-Acts; B. Galatians and I Corinthians; C. The Pastoral Epistles. (N.T. 116 A, N.T. 116 B. and N.T. 116 C are separate courses, offered in different semesters.) 2 s.h. STAFF

117. EXEGESIS OF THE ENGLISH NEW TESTAMENT II.—A. The Gospel and Epistles of John; B. Romans. (N.T. 117 A and N.T. 117 B are separate courses, offered in different semesters.) 2 s.h. STAFF

118. THE NEW TESTAMENT IN GREEK.—Readings in the Gospels. 3 s.h. STAFF

119. THE NEW TESTAMENT IN GREEK.—Readings in the Epistles. 3 s.h. STAFF

* Course offered in the Graduate School of Arts and Sciences which is credited toward the degree of Bachelor of Divinity.

225. LIVING ISSUES IN NEW TESTAMENT THEOLOGY.—Examination of recent major questions of debate in the New Testament field. Prerequisite: N.T. 19. 3 s.h. MR. ANDERSON

226. EXEGESIS OF THE GREEK NEW TESTAMENT I.—A. Mark and Matthew; B. Romans; C. Colossians and Ephesians. (N.T. 226 A, N.T. 226 B, and N.T. 226 C are separate courses, offered in different semesters.) Prerequisite: N.T. 103-104. 3 s.h. MR. PRICE

227. EXEGESIS OF THE GREEK NEW TESTAMENT II.—A. Luke-Acts; B. Galatians and I Corinthians; C. The Pastoral Epistles; D. The Apocalypse. (N.T. 227 A, N.T. 227 B, N.T. 227 C, N.T. 227 D are separate courses, offered in different semesters.) Prerequisite: N.T. 103-104. 3 s.h. MR. ANDERSON OR MR. SMITH

318. TEXTUAL CRITICISM OF THE NEW TESTAMENT.—A study of the scientific recovery of the Greek text on which modern versions are based; manuscript discoveries; principles of textual criticism; practice in collating original manuscripts in the Duke collection. Prerequisite: N.T. 103-104, or the equivalent. 3 s.h. MR. CLARK

340-341. SEMINAR IN THE NEW TESTAMENT.—Research and discussion on a selected problem in the Biblical field. 2 s.h. MR. ANDERSON AND/OR MR. SMITH

SEE ALSO Pr. 185 and O.T. 209.

*GREEK 257.—The social and cultural history of the Hellenistic world from Alexander to Augustus. 3 s.h. MR. ROGERS

*LATIN 258.—The social and cultural history of the Graeco-Roman world. 3 s.h. MR. ROGERS

II. Historical Studies

CHURCH HISTORY

13. HISTORY OF THE CHURCH TO THE PROTESTANT REFORMATION.—A survey through the fifteenth century in terms of spiritual genius, organizational development, great literature, and representative movements. 3 s.h. MR. PETRY

14. HISTORY OF MODERN EUROPEAN CHRISTIANITY.—A survey of the main currents in Reformation and post-Reformation church history. 3 s.h. MR. HILLERBRAND

85. SEMINAR IN MODERN EUROPEAN CHRISTIANITY.—A seminar devoted to the study of select aspects of Reformation and Post-Reformation Church History. This year the seminar will consider Reformation and Post-Reformation Confessions of faith. Prerequisite: C.H. 13-14. 2 s.h. MR. HILLERBRAND

137. RELIGIOUS LEADERS IN CHRISTIAN HISTORY.—Representative leaders in the early and medieval church studies in relation to contemporary churchmanship. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

138. GREAT BOOKS IN CHRISTIAN HISTORY.—An intensive study of Augustine's *Confessions,* Thomas à Kempis' *Imitation of Christ,* Erasmus's *Complaint of Peace,* Luther's *Christian Liberty,* Calvin's *Instruction in Faith,* and Andrewes' *Private Devotions.* 3 s.h. MR. PETRY

139. METHODISM.—A study of Methodist societies in England and the developing church in America as they gave rise to such historic issues as polity, education, division, and reunion. Prerequisite: C.H. 13. 2 s.h. MR. PETRY

140. THE RISE OF METHODISM AND THE ANGLICAN BACKGROUND.—The Methodist societies within the Church of England to the death of Wesley. Prerequisite: C.H. 13-14. 3 s.h. MR. BAKER

(Students are advised that either C.H. 139 or C.H. 140 will satisfy the Methodist Discipline Requirement No. 344.)

142. BRITISH METHODISM AFTER WESLEY.—British Methodism in its nineteenth and twentieth century development. Prerequisite: C.H. 14. 3 s.h. MR. BAKER

* Course offered in the Graduate School of Arts and Sciences which is credited toward the degree of Bachelor of Divinity.

250. THE REFORMATION AND COUNTER REFORMATION.—History and thought of European Christianity between 1517-1680. 3 s.h. Prerequisite: C.H. 13, 14. MR. HILLERBRAND

251. PIETISM, DEISM, AND RATIONALISM.—History and thought of European Christianity between 1650 and 1750. 3 s.h. MR. HILLERBRAND

330. THE CHURCH IN EUROPE SINCE 1800.—Emphasis is placed on the relation of the church to the social, economic, and political life of Modern Europe. Particular attention is given to Papal pronouncements on social issues, the relationship of Eastern to Western institutions, and ecclesiastical historiography as it involves source editions, periodicals, and ecumenical literature. 3 s.h. MR. PETRY

331. THE SOCIAL MESSAGE OF THE EARLY AND MEDIEVAL CHURCH.—A study of the social teachings and contribution of the Christian church prior to the Protestant Reformation. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

332. THE MEDIEVAL CHURCH.—Outstanding characteristics of the medieval church, emphasizing theory, polity, institutions, sacraments, and worship. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

334. CHURCH REFORMERS AND CHRISTIAN UNITY.—The work of such reformers as Marsilius of Padua, William of Ockham, Jean Gerson, Pierre d'Ailly and Nicholas of Cusa in relation to ecclesiastical schism and the search for Christian unity through representative councils. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

336. CHRISTIAN MYSTICISM IN THE MIDDLE AGES.—Source studies, in historical perspective, of such late medieval mystics as Bernard of Clairvaux, the Victorines, Ramon Lull, Meister Eckhart, Richard Rolle, Catherine of Siena, and Nicholas of Cusa. Prerequisite: C.H. 13. 3 s.h. MR. PETRY

339. LEFT WING MOVEMENTS OF THE REFORMATION.—A survey of the history and theology of the "radical" Reformation. 2 s.h. MR. HILLERBRAND

HISTORICAL THEOLOGY

21. THE THEOLOGY OF THE PROTESTANT REFORMATION.—The Reformation of the 16th century and its outcome in the 17th and 18th centuries. 3 s.h. MR. GRISLIS

111. LITERATURE OF THE LATIN CHURCH.—Readings, in the Latin originals, of diverse kinds of writing produced by the Latin Church in various periods of its history. Prerequisite: Permission of instructor. 3 s.h. MR. STRUGNELL

120. FAITH AND HERESY IN DIALOGUE.—Studies in the origin and role of the Apostles' the Nicene and the Chalcedonian Creeds in their contemporary setting. 3 s.h. MR. GRISLIS

121. SACRAMENTS IN THE CHRISTIAN CHURCH.—Ecumenical studies in devotion and division: Baptism and the Lord's Supper. 3 s.h. MR. GRISLIS

123. THE THEOLOGY OF THE EARLY CHURCH.—An introduction to the history of doctrine from the 2nd to the 6th centuries. 3 s.h. MR. GRISLIS

129. CRITICS OF CHRISTIANITY.—A Survey of Anti-Christian Polemics from Celsus to Nietzsche. 2 s.h. MR. HILLERBRAND

234. THE THEOLOGY OF THOMAS AQUINAS.—A systematic interpretation of the thought of Aquinas, with a major emphasis on his specifically theological formulations, drawing upon the *Summa Theologica* and other relevant sources. 3 s.h. MR. GRISLIS

240. THE THEOLOGY OF RICHARD HOOKER.—An exposition of the writings of the Systematic Theologian of Anglicanism in the sixteenth century. 3 s.h. MR. GRISLIS

260. SEMINAR: LIFE AND THOUGHT OF THE WESLEYS.—A seminar on John and Charles Wesley and their colleagues in relation to English culture and religion in the eighteenth century. Permission of instructor. 3 s.h. MR. BAKER

261. THE THEOLOGY OF JOHN WESLEY.—A study of the development and structure of Wesley's theology, with special reference to his doctrines of man and salvation. Prerequisite: Permission of instructor. 2 s.h. MR. RICHEY

337. THE THEOLOGY OF MARTIN LUTHER.—A critical and comparative examination of Luther's thought. 2 s.h. MR. HILLERBRAND

338. THE THEOLOGY OF JOHN CALVIN.—An exposition of the *Institutes of the Christian Religion* in relation to cognate documents. Prerequisite: H.T. 21. 3 s.h. MR. GRISLIS

AMERICAN CHRISTIANITY

28. HISTORY OF AMERICAN CHRISTIANITY.—A consideration of the nature of Christianity in America and the history of its development. 3 s.h. MR. HENRY

199. THE AMERICAN SOCIAL GOSPEL.—A study of Protestant social thought and action in America since 1865. 3 s.h. MR. NORMENT

296. RELIGION ON THE AMERICAN FRONTIER.—A study of the spread of evangelical Christianity as a theological and cultural phenomenon of the American West. Prerequisite: A.C. 28. 3 s.h. MR. HENRY

372. THEOLOGY OF PAUL TILLICH.—An examination of Tillich's philosophical theology. 2 s.h. MR. ROBINSON

385. RELIGION IN AMERICAN LITERATURE.—A critical study of the meaning and value of religious motifs reflected in American literature. 3 s.h. MR. HENRY

395. CHRISTIAN THOUGHT IN COLONIAL AMERICA.—Exposition of the main currents in Protestant Theology. 3 s.h. MR. HENRY

396. LIBERAL TRADITIONS IN AMERICAN THEOLOGY.—A study of the main types of modern religious thought, beginning with the theology of the Enlightenment. 3 s.h. MR. HENRY

397. CONTEMPORARY AMERICAN THEOLOGY.—A critical appraisal of major tendencies. 3 s.h. MR. HENRY

WORLD CHRISTIANITY

24. PHILOSOPHY OF THE CHRISTIAN WORLD MISSION.—A study of theological foundations, guiding principles, and contemporary problems of the World Christian Community. 2 s.h. MR. LACY

133. HISTORY OF CHRISTIAN MISSIONS.—A survey of the spread of Christianity with special emphasis on 19th and 20th century Protestantism. 2 s.h. MR. LACY

135. AREA STUDIES OF THE CHRISTIAN CHURCH.—The cultural setting and current programs and policies of the Church in one of the following areas: a. Latin America, b. India and Pakistan, c. Africa, d. Southeast Asia, e. Japan-Korea-Philippines, f. Moslem Lands, or g. United States Home Missions. (The area of study to be determined by student interest in consultation with the instructor.) 2 s.h. MR. LACY AND OTHERS

156. THE ECUMENICAL MOVEMENT.—Its contemporary development, structures, activities—and problems, against the background of Church unity and disunity. 3 s.h. MR. LACY

386. SEMINAR: THEOLOGICAL TRENDS IN THE WORLD CHURCH.—Contemporary currents of Christian thought as they affect the resurgent non-Christian faiths, new formulations of a theology of mission, and ecumenical conversations. 3 s.h. MR. LACY

SEE ALSO: C.Ed. 126, C.E. 190, C.E. 292, and C.E. 333.

HISTORY OF RELIGIONS

158. CONTEMPORARY NON-CHRISTIAN RELIGIONS.—Critical consideration of contemporary conditions in major non-Christian traditions, with special reference to Hinduism, Buddhism, Islam, and African Religions. 3 s.h. MR. SULLIVAN

180. RELIGIONS OF THE NEAR EAST.—Historical and theological introduction to the major indigenous traditions of the Near East, especially Zoroastrianism, and Islam. 3 s.h. MR. PARTIN

182. RELIGIONS OF INDIA.—Historical and theological introduction to Indian religious life and thought. The development of Buddhism is covered, as well as Jainism and Sikhism, along with the various modes of Hinduism. 3 s.h.
MR. SULLIVAN

279. RELIGIONS OF EAST ASIA.—A study of the major traditions of China and Japan with emphasis on the development and expansion of Buddhism. 3 units.
MR. SULLIVAN

280. THE HISTORY OF RELIGIONS.—A study of the methodology of the History of Religions, the nature of religious experience and specific categories of religious phenomena. Permission of instructor. 3 s.h. MR. SULLIVAN

III. Theological Studies

PHILOSOPHY OF RELIGION

20. TYPES OF RELIGIOUS PHILOSOPHY.—Basic historical orientation in religious thought, especially in Western Culture. 3 s.h. MR. ROBINSON

102. CHRISTIAN APOLOGETICS AND MODERN WORLD VIEWS.—A constructive approach to the Hebrew-Christian understanding of Creator and creature in the light of contemporary scientific knowledge. 3 s.h. MR. ROBINSON

CHRISTIAN THEOLOGY

32. CHRISTIAN THEOLOGY I.—A constructive statement of the themes of systematic theology as a task of the church today: theological method, knowledge of God, man, and Christ. 3 s.h. MR. CUSHMAN AND MR. HALL

33. CHRISTIAN THEOLOGY II.—God the redeemer, the church, word and sacraments, authority and ministry, the Kingdom of God. 3 s.h. MR. HERZOG

108. REVELATION AND AUTHORITY.—A study of the relationship between revelation, Bible, preaching and the church. 3 s.h. MR. HERZOG

110. THIS LIFE AND THE AGE TO COME.—Christian eschatology and the meaning of history in the light of God's triumph over sin, suffering, and death. 3 s.h. MR. ROBINSON

*125. THEOLOGICAL AND PSYCHOLOGICAL INTERPRETATIONS OF MAN.—An inquiry into the relations of theological and psychological views of man's nature, predicament, and deliverance. 3 s.h. MR. RICHEY

195. ORIGINS OF DOGMATIC THOUGHT.—An analysis of dogmatic concepts in the Gospel of John: their development into a body of doctrine. 3 s.h.
MR. HERZOG

200. THE PERSON AND WORK OF CHRIST.—The problem of knowledge of Christ and formulation of a doctrine of his work and person in the light of Biblical eschatology. Prerequisite: C.T. 32-33. 3 s.h. MR. CUSHMAN OR MR. HALL

213. THE STRUCTURE OF ROMAN CATHOLIC THOUGHT.—The main characteristics of Roman Catholic theology with consideration of possibilities and limitations in ecumenical conversation with Rome. Prerequisites: C.H. 13 and 14 and H.T. 21. 3 s.h. MR. HERZOG

216. KIERKEGAARD STUDIES.—Critical examination of selected works. Prerequisite: C.T. 32 or permission of the instructor. 3 s.h. MR. ROBINSON

224. CONCEPTIONS OF MAN IN WESTERN THOUGHT.—An analysis and interpretation of important types of philosophical and theological theory. 3 s.h.
MR. RICHEY

303. DOGMA AND THE PROBLEM OF HISTORY.—The authority of Kerygma and the Word of God in twentieth-century European theology. 3 s.h. MR. HERZOG

320. SEMINAR: FRIEDRICH SCHLEIERMACHER.—Critical examination of the dogmatic system. Prerequisite: C.T. 322. 3 s.h. MR. HERZOG

* May be taken and grade recorded as Christian Educ. 125.

322. NINETEENTH CENTURY EUROPEAN THEOLOGY.—Protestant theology from Kant to Herrmann. 3 s.h. MR. HERZOG

323. SEMINAR: BULTMANN.—Critical examination of representative works, with some consideration of relation to the work of Martin Heidegger. Prerequisite: C.T. 32-33 or permission of the instructor. 3 s.h. MR. ROBINSON

325. PHILOSOPHICAL THEOLOGY I.—Main problems in the history of philosophical theology from the pre-Socratics to Descartes. Prerequisite: C.T. 32-33. 3 s.h. MR. ROBINSON

326. PHILOSOPHICAL THEOLOGY II.—Main problems of philosophical theology in the modern period. Prerequisite: C.T. 325. 3 s.h. MR. ROBINSON

328. SEMINAR IN TWENTIETH CENTURY EUROPEAN THEOLOGY.—Critical examination of the thought of selected representative theologians. Prerequisite: C.T. 32-33 and permission of instructor. 3 s.h. MR. HERZOG

CHRISTIANITY AND CULTURE

16. CONTEMPORARY WESTERN CULTURE.—An analysis of the conceptual commitments in contemporary styles of thought and life as reflected in the natural sciences, philosophy, social analysis, and the arts. 3 s.h. MR. POTEAT

80. THE CHRISTIAN FAITH AND TRAGEDY.—An exploration of the tragic view of life as exhibited in selected classic and contemporary works of literature and a comparison of this with Christian belief. 3 s.h. MR. POTEAT

81. RECENT AND CONTEMPORARY ART AND THEOLOGY.—The study of 19th and 20th century painting and sculpture as documents of contemporary man's apprehension of himself and his world; and as elements in the conversation between Christian faith and culture. 3 s.h. MR. POTEAT

230. THE MEANING OF RELIGIOUS LANGUAGE.—An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. Prerequisite: C.T. 32-33 or permission of instructor, 3 s.h. MR. POTEAT

231. SEMINAR IN CHRISTIANITY AND CONTEMPORARY THOUGHT.—Analytical reading and discussion of such critical cultural analysis as is found in the works of M. Polanyi, Arendt, Trilling, and others, with appraisal of the relevance for theological inquiry. Prerequisite: C.T. 32-33 or permission of instructor. 3 s.h. MR. POTEAT

380. EXISTENTIALIST THOUGHT.—An analysis of writings of representative thinkers from Kierkegaard to Sartre. Prerequisite: C.T. 32-33, or permission of instructor. 3 s.h. MR. POTEAT

CHRISTIAN ETHICS

27. CHRISTIAN ETHICS I.—The central assumptions and principles of the Christian conception of the good life. 3 s.h. MR. BEACH

114. CHRISTIAN SOCIAL ETHICS.—The principles of Christian social policy with reference to domestic, social, political, and economic patterns of contemporary culture. MR. SMITH

115. CHRISTIAN SOCIAL ACTION IN THE LOCAL CHURCH.—Christian ethical principles, resources, procedures, and programs for pastoral leadership in parish social action. 2 s.h. MR. SMITH

122. MORAL THEOLOGY IN THE NINETEENTH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of representative theologians. 3 s.h. MR. SMITH

124. MORAL THEOLOGY IN THE TWENTIETH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of William Temple and selected contemporary theologians. 3 s.h. MR. SMITH

190. THE CHRISTIAN CRITIQUE OF COMMUNISM.—Analysis of and alternatives to the dynamic secular ideology from a religious standpoint. 3 s.h. MR. LACY

194. THE PROTESTANT CHURCH AND AMERICAN CULTURE.—Analysis from the perspective of Christian ethics of current problems in the interpenetration of Church and culture with explicit reference to the parish setting. 3 s.h.
MR. SMITH

292. CHRISTIAN ETHICS AND INTERNATIONAL RELATIONS.—An examination of Christian attitudes toward such issues as war and peace, the rule of law, foreign aid, and human rights; and the Church's contribution to international policies and institutions. 3 s.h. MR. LACY

333. SEMINAR: MARXIST IDEOLOGY AND CHRISTIAN FAITH.—Comparative study of Communist and Christian doctrines of man, society, sin, history, ethics, and eschatology. Prerequisite: C.E. 190 or equivalent. 3 s.h. MR. LACY

389. CHRISTIAN ETHICS AND CONTEMPORARY CULTURE.—A study of the interaction between Christian thought and current secular social theory. Prerequisite: C.E. 27 or its equivalent. 3 s.h. MR. BEACH

390. CURRENT PROBLEMS IN CHRISTIAN ETHICAL THEORY.—A critical study, seminar style, of dominant issues in Christian Ethics, through an analysis of a variety of contemporary Christian treatments of such problems as love, justice, community and vocation. Prerequisite: C.E. 27 or its equivalent. 3 s.h.
MR. BEACH

391. HISTORICAL TYPES OF CHRISTIAN ETHICS I.—A critical study of representative statements of Christian ethical theory, through the early Reformation. Prerequisite: C.E. 27 or its equivalent. 3 s.h. MR. BEACH

392. HISTORICAL TYPES OF CHRISTIAN ETHICS II.—A continuation of C.E. 391, from the Reformation through current Christian ethical theory. Prerequisite: C.E. 391. 3 s.h. MR. BEACH

393. THE CHRISTIAN INTERPRETATION OF HISTORY.—A comparative examination of the chief secular and Christian theories of history current in Western thought. For advanced students. Prerequisite: C.E. 27. 3 s.h. MR. BEACH

394. CHRISTIANITY AND THE STATE.—The relation of the Christian theory of the State to political problems with special consideration of the religious assumptions underlying democratic theory and practice, and of the relationship of Church to State. Prerequisite: C.E. 27. 3 s.h. MR. BEACH

IV. Professional Studies

THE CARE OF THE PARISH

10. THE CHURCH AND THE MINISTER'S VOCATION.—An orientation course for beginning students, devoted to a consideration of the nature of the Church and the tasks of the ministry. 1 s.h. STAFF

23. THE CARE OF THE PARISH.—A consideration of the pastor's function as leader of the Christian community. 3 s.h. MR. INGRAM AND OTHERS

146. CHURCH BUILDING.—The role of the pastor in planning and executing building programs in the local church: architectural considerations and counsel, building requirements and plans. 2 s.h. MR. NESBITT

148. CHRISTIAN STEWARDSHIP AND CHURCH FINANCE.—A seminar to consider the principles of stewardship education, budget making, enlistment in church support. 2 s.h. MR. INGRAM AND MR. KALE

150. RURAL CHURCH AND COMMUNITY.—The structure and dynamic factors shaping the present-day rural community together with their import for the work of the Church. 2 s.h. MR. SCHORES

151. THE TOWN AND COUNTRY CHURCH.—The small church, the circuit church, circuit administration, larger parish and group ministry, and the Town and Country movement. 2 s.h. MR. NESBITT

152. EVANGELISM AND THE LOCAL CHURCH.—A study of the nature, purposes and methods of contemporary Christian evangelism with special attention to the local church. 2 s.h. MR. KALE AND MR. INGRAM

153. PASTORAL LEADERSHIP IN THE LOCAL CHURCH.—A study of the pastor's role in determining the objectives and program of the local church with attention to planning for the church year. 2 s.h. MR. INGRAM

154. THE URBAN CHURCH.—The function, nature, program, and administration of the effective city church and of the urban minister's distinctive task. 2 s.h. MR. INGRAM

155a. THE POLITY OF THE METHODIST CHURCH.—The history and present structure of the organization of The Methodist Church. 2 s.h. MR. INGRAM

155b. THE POLITY OF THE BAPTIST CHURCHES.

155c. THE POLITY OF THE CONGREGATIONAL-CHRISTIAN CHURCHES.

155d. THE POLITY OF THE PRESBYTERIAN CHURCHES. STAFF

157. RESEARCH AND SURVEY FOR THE PARISH MINISTER.—An introduction to basic forms of sociological research as applied to the local church: self-evaluations, religious census, opinion polls, community surveys, use of secular resources and agencies. Field and laboratory methods will be explored through involvement in a research project. 2 s.h. MR. SCHORES

FIELD WORK PRACTICUM I.—Discussion of various aspects of parish work with opportunity for students to seek guidance respecting procedures and problems. Designed especially for students with parish responsibilities. (Fall Semester. Sections arranged.) 1 s.h. MR. SCHORES AND OTHERS

FIELD WORK PRACTICUM II.—Required of students expecting summer assignments under the Endowment and Field Work Program. Types of parish service to be discussed. (Spring Semester) 1 s.h. MR. SCHORES AND OTHERS

CHRISTIAN EDUCATION

22. THEOLOGY AND CHRISTIAN NURTURE.—The implications of theology and educational philosophy for the theory and practice of Christian education. 3 s.h. MR. RICHEY

25. THE CHURCH AND CHRISTIAN NURTURE.—A constructive survey of the local church as a community of Christian nurture: Statement and evaluation of objectives, leadership and resource materials, structural patterns and administrative and supervisory procedures for the church school. 2 s.h. MR. KALE

125. THEOLOGICAL AND PSYCHOLOGICAL INTERPRETATIONS OF MAN.— (See C.T. 125)

126. MISSIONARY EDUCATION IN THE LOCAL CHURCH.—Practical programs for church school, audio-visual aids, preaching, stewardship, and special projects. 2 s.h. MR. LACY AND OTHERS

129. RELIGION AND PERSONALITY.—Investigation of religious aspects of the origins, structure, and development of selfhood. 3 s.h. MR. RICHEY

149. THE MINISTRY TO THE CAMPUS.—An examination of the circumstances which have produced, and the unique problems which confront, the ministry on the campus, considered from the perspective of the Christian idea of higher education. 3 s.h. STAFF

161. TEACHING METHODS.—Basic teaching procedures required by professional and lay workers in the local church. Opportunities are arranged for observation and guided practice in church schools, and/or other institutions. Required for candidates for the M.R.E. degree. 3 s.h. MR. KALE

162. CURRICULUM BUILDING IN THE LOCAL CHURCH.—An examination of influential theories of and contemporary trends in curriculum construction, together with an evaluation of existing curricula. Actual designing of short units for use in the local church. 3 s.h. MR. KALE

164. CHRISTIAN EDUCATION OF CHILDREN.—The organization and administration of the work of the church with children of the nursery, kindergarten, primary and junior age groups. 2 s.h. MR. KALE

165. CHRISTIAN EDUCATION OF YOUTH.—The organization and administration of the youth program in the local church. 2 s.h. MR. KALE

166. CHRISTIAN EDUCATION OF ADULTS.—A study of the needs of adults; the materials, methods, and principles of organization for the Christian education of adults. 2 s.h. MR. KALE

167. THEOLOGY AND THE LAITY.—A study of contemporary lay movements and centers, the ministry and mission of the laity in Church and world, and the ministry of teaching in the lay renewal of the Church. (For Middlers and Seniors.) 3 s.h. MR. RICHEY

169. THEORIES OF CHRISTIAN EDUCATION.—A critical investigation of current theories of Christian education. 2 s.h. MR. RICHEY

CHRISTIAN EDUCATION PRACTICUM.—Required of M.R.E. candidates. One class per week and supervised project. 3 s.h. MR. KALE AND OTHERS

PASTORAL CARE

26. INTRODUCTION TO PASTORAL CARE.—The psychology of personal adjustment and pastoral care. An approach to pastoral care and its place in the pastor's total ministry grounded in an understanding of the dynamics of personal adjustment. 3 s.h. MR. GOODLING

170. INTRODUCTION TO PASTORAL COUNSELING.—The philosophy and techniques of formal counseling through discussions of textual and interview material. Prerequisite: P.C. 26. 3 s.h. MR. GOODLING

171. PASTORAL CARE PRACTICUM I.—Pastoral Calls and Personal Counseling. A study of pastoral calling and personal counseling in the parish ministry. Prerequisites: P.C. 26 and 170. 2 s.h. STAFF

172. PASTORAL CARE PRACTICUM II.—Marriage and the Family. A consideration of pre-marital and marital counseling and the psychodynamics of family life. Prerequisites: P.C. 26 and 170. 2 s.h. MR. GOODLING

173. PASTORAL CARE PRACTICUM III.—The Chaplain in a Rehabilitation Program. The ministry to those in alcoholic and correctional institutions. Prerequisites: P.C. 26 and 170. 2 s.h. STAFF

174. THE CHURCH AND MENTAL HEALTH.—The meaning of the self and the resources of the church in doctrine and worship in self-fulfillment. 2 s.h.

175. ADVANCED PASTORAL CARE PRACTICUM.—For advanced students who want additional clinical experience in one of the Pastoral Care Practicum areas. Consent of the instructor is required. Students may register for from 1 to 5 s.h. clinic credit. STAFF

176. PASTORAL CARE PRACTICUM IV.—The Psychiatric Setting. Lectures by staff and ward visits at the Dorothea Dix Hospital in Raleigh. The place of the minister in a program dealing with the causes, treatment, and prevention of mental illness. Prerequisites: P.C. 26 and 170. 3 s.h. MR. STEININGER

177. PASTORAL CARE PRACTICUM V.—The Hospital Ministry. Pastoral care and counseling with the ill, the dying, bereaved. Prerequisites: P.C. 26 and 170. 2 s.h. and 1 s.h. clinic. MR. GOODLING

188. SCIENCE, FAITH AND PSYCHOANALYSIS.—An analysis of the fundamental categories of the Christian message and psychoanalysis. An exploration into the objectives and the methods of science and the meaning of religion. 3 s.h.

271. CLINICAL PASTORAL TRAINING I.—Out-Patient Counseling under psychiatric supervision. 4 s.h. STAFF

273. CLINICAL PASTORAL TRAINING II.—The Chaplain in a Rehabilitation program. Twenty hours of supervised clinical training weekly in a rehabilitation institution. 4 s.h. STAFF

276. CLINICAL PASTORAL TRAINING III.—The Chaplain in a Psychiatric Setting: the mental hospital.

276A. Full-time 12-week summer quarter. 6 s.h.

276B. Twenty hours per week, fall semester. 4 s.h.

276C. Twenty hours per week, spring semester. 4 s.h. STAFF

277. CLINICAL PASTORAL TRAINING IV.—The Chaplain in the General Hospital setting.

277A. Full-time 12-week summer quarter. 6 s.h.

277B. Twenty hours per week, fall semester. 4 s.h.

277C. Twenty hours per week, spring semester. 4 s.h. STAFF

THE CHURCH AT WORSHIP

34. WORKSHOP IN COMMUNICATION.—Intensive drill in voice, diction, speaking and reading. Enrollment by recommendation of teaching faculty. 1 s.h. MR. RUDIN

PREACHING

29-30. SERMON CONSTRUCTION—THEORY AND PRACTICE.—An investigation of the theory of preaching (first semester). Detailed work in practice preaching and a clinical session each week on the application of theory (second semester). 3 s.h. MR. HALL AND OTHERS

31. ADVANCED SERMON PRACTICE.—A weekly session of clinical exercises in expository preaching and sermon evaluation for senior students of Vocational Group I. Prerequisite: Pr. 29-30. 1 s.h. STAFF

181. PRACTICAL PROBLEMS IN PREACHING.—Analysis of selected sermons and discussion of problems facing the preacher in the pulpit. Prerequisite: Pr. 29. 2 s.h. MR. CLELAND AND MR. HALL

183. EXPOSITORY PREACHING—OLD TESTAMENT.—The exegesis and exposition of selected Old Testament passages for homiletical purposes. Prerequisite: Pr. 29. 2 s.h. MR. CLELAND

184. EXPOSITORY PREACHING—THE PAULINE EPISTLES.—A study for homiletical purposes of the religious experience and theology of Saint Paul and its influence on ethical theory and practice. Prerequisite: Pr. 29. 3 s.h. MR. CLELAND

185. EXPOSITORY PREACHING—NON-BIBLICAL.—An evaluation of drama, poetry and fiction for homiletical purposes. Prerequisite: Pr. 29. 3 s.h. MR. CLELAND

187. PRE-REFORMATION PREACHING.—Sermons, handbooks, and other historical sources studied in relation to Biblical preaching and the liturgical church, the problem of popular ministry and the issues of Christian reform. Prerequisite: C.H. 13. 2 s.h. MR. PETRY

193. THEOLOGY AND PREACHING.—An examination of the relation of systematic theology and homiletical presentation in the sermons of major Christian leaders, past and present. 3 s.h. MR. HALL

WORSHIP AND CHURCH MUSIC

40. THE CHURCH AT WORSHIP.—The structure of worship, the rites of the church, its music, and the conduct of worship in the context of the Christian year. 3 s.h. MESSRS. CLELAND, HANKS AND RUDIN

134. LITURGICAL READING.—Practice in reading the liturgical materials of the pastoral ministry: Scriptures, prayers, and the rites and seasonal services in the Methodist *Book of Worship*. 2 s.h. MR. RUDIN

141. THE CLASSIC AGE OF THE ENGLISH HYMN.—Eighteenth century development of the English hymn with special reference to Watts and the Wesleys, their precursors and successors. 2 s.h. MR. BAKER

178. CORPORATE WORSHIP.—The theory and practice of the common worship of the Church, using various manuals of worship. One hour to be arranged. 2 s.h. MR. RUDIN

180. CHURCH MUSIC.—A two-fold study including: (1) A survey of the great monuments of church music, (2) Musicianship, songleading and basic conducting; with an emphasis upon the use of the hymn tunes and other music in the Methodist hymnal. 3 s.h. MR. HANKS

CHAPEL CHOIR.—Students who successfully complete C.W. 40 or C.W. 180 before graduation may qualify for credit (to the limit of 2 s.h.) of ½ s.h. for each semester of effective participation in the Chapel Choir. Choir membership (granted by audition) affords opportunity for study of the history and background of church music, and practical consideration of it in the context of public worship.

Student Expenses and Residential Arrangements

FEES AND COSTS

THERE is an admission fee of $30. which is applied to the first-term bill. (See statement of requirements for admission for full details).

Items	*Per Semester*
Tuition	$262.50
General Fee	56.50
Approximate cost of meals (estimated)	275.00
Room (double) for men	125.00
Total	$719.00

The General Fee is in lieu of all special charges, and includes the following fees: Matriculation, Medical, Library, Damage, Commencement, and Diploma. Both the Tuition and General Fee are due and payable not later than the day of registration for a particular semester.

A student who is a candidate for a degree (B.D., M.R.E., or Th.M.) shall be liable for the Tuition and the General Fee for the number of semesters required to complete the degree under a normal load of 15 semester hours. The B.D. candidate will pay tuition for six (6) semesters, the M.R.E., four (4) semesters, and the Th.M., two (2) semesters. If extra semesters are required to complete the degree, there will be no tuition; however, the General Fee will be payable on a prorated basis.

Special Students are those who are enrolled but who are not candidates for a degree. Tuition and General Fee for these will be on a prorated basis.

Students matriculating in either semester at a date later than that prescribed in the catalogue shall pay to the Bursar of the University a penalty of $5.00. After the day of registration no refund of the General Fee or tuition will be made except for involuntary withdrawal to enter the Armed Services.

Divinity School Students may secure admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of the athletic fee of $15.00 per year, plus any Federal tax that may be imposed. This fee is payable in the fall semester.

Students who are reported by the Treasurer's Office as delinquent in their accounts will be debarred from credit in courses until cleared

by the Treasurer's Office. Transcripts will not be issued for delinquent students.

The total cost for a student to attend the Duke Divinity School varies according to individual tastes and requirements; however, experience indicates that a single student may expect to spend from $1800 up with the average approximately $2050, and a married couple may expect to spend from $3000 up.

The Board of Trustees of Duke University determines the costs of attending the Divinity School and these are subject to change without notice.

AUDITING OF COURSES

Persons seeking to audit Divinity School courses must, with the consent of the instructor concerned, secure permission of the Dean's office. In accordance with general University practice a fee of $15.00 per course will be required of all auditors who are not enrolled students.

STUDENT HEALTH

The payment of the general fee entitles the student who is taking at least 7 hours or more to full medical and surgical care, with the exceptions noted below. This service is under the direction of the University Physician with the co-operation of the staff of Duke Hospital. It includes hospitalization, medical and surgical care, drugs, dressings, X-ray studies, and ward nursing. A charge for board is made at the same rate as in the University dining halls. Refraction of eyes, treatment of teeth and of all chronic conditions, such as the removal of diseased tonsils, are not included in this service. The cost of any necessary braces and orthopedic appliances, as well as of special nursing, must be borne by the student.

Since the Student Health Program does not cover students while away from the Duke Campus, it is imperative that student pastors and assistant pastors (winter and/or summer) who are subjected to the hazards of highway travel with great frequency, secure complementary health and accident insurance for the full 12 month period.

Information concerning such a policy may be secured by inquiring at the office of the Dean of Students. Such a complementary policy is recommended for all students.

Married students are required to carry insurance coverage for their dependents, providing for hospital, medical and surgical care.

LIVING ACCOMMODATIONS

The Men's Graduate Center is available to men enrolled in the Divinity School. The rooms are equipped for two persons and the rental charge for a double room is $125.00 each semester per occupant.

Epworth Hall on the Woman's College Campus is available to women enrolled in the Divinity School. The rental charge for a double room is $137.50 per semester for each occupant.

The rental charge for a single room is higher.

Duke University Apartments, which consist of efficiency, one- and two-bedroom apartments, are available to married graduate students. The apartments are complete with basic furnishings and the current rental charges per month are $70.00 for the efficiency, $80.00 for the one-bedroom, and $90.00 for the two-bedroom. Heat, electricity, except for window fans and air conditioners, hot and cold water, garbage and trash collection, and maintenance of grounds are all included in the rental charge. For further information on married student apartments, write to the Housing Bureau, Duke Station, Durham, North Carolina.

Residence hall rooms and Duke University Apartments may be reserved by new applicants only if they have been accepted officially for admission to the Divinity School. Applications for residence hall rooms are to be made to the Housing Bureau, Duke Station, Durham, North Carolina. A $25.00 room deposit is required of each applicant before a residence hall room reservation is made. The initial room deposit is effective during the student's residence in the University residence halls if attendance is continuous in regular academic years. The deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated provided written notice is received at the Housing Bureau requesting refund.

b. Upon withdrawal from Duke University Residence Halls by students enrolled on the semester basis, provided written notice is received in the Housing Bureau by August 1st for cancellation of a reservation for the fall semester, and not later than January 15th for cancellation of a reservation for the spring semester.

c. When the reasons requiring withdrawal are beyond the student's control.

No refund will be made until the occupant has checked out of his room through the Housing Bureau and has settled his account with the Bursar.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of the reservation.

The authorities of the University do not assume responsibility for persons selected as roommates. Each student is urged to select his roommate when the room is reserved. Any student who occupies a double room without a roommate will be given written notice from

the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room.

Any exchange of rooms must be made at the Housing Bureau. Persons exchanging rooms without the approval of the Housing Bureau will be subject to the charges for both rooms.

Rooms are rented for the academic year but for no period of less than one semester without special arrangements. After the day of registration, no refund of room rent will be made except for involuntary withdrawal to enter the Armed Services. Such refunds will be made in accordance with the University's established schedule. Regulations governing the occupancy of rooms will be supplied by the Housing Bureau to those students who make application for housing. Occupants are expected to abide by these regulations.

DINING HALLS

Food service on both the Woman's College Campus and the West Campus is cafeteria style. The cost of meals approximates $250.00-$300.00 per semester depending upon the need and taste of the individual. The dining facilities on the West Campus include three cafeterias with multiple choice menus and, in addition, the Oak Room, where full meals and a la carte items are served. The Men's Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 P.M. The prices are the same as in the West Campus Union.

MOTOR VEHICLES

Each motor vehicle operated on the campuses by students enrolled in the Divinity School must be registered at 016 Social Science Building within 5 days after arrival, and thereafter must display the proper registration emblem. To register a vehicle the student must present the following documents:

1. State vehicle registration.
2. State operator's license.
3. Evidence of automobile liability insurance as required by North Carolina law: $5,000 per person and $10,000 per accident for personal injuries; and $5,000 property damage.

An annual car registration fee of $30.00 is required of unmarried students resident in dormitories.

Parking, Traffic, and Safety Regulations will be given each student registering his vehicle. Students are expected to abide by these regulations.

Statement on Financial Aid

IT IS proper that a student should select his school on the basis of educational opportunity. At the same time financial consideration will be of legitimate and often pressing concern. Each student should formulate at least a tentative plan for financing his seminary education. Such a plan would not of necessity demand absolute assurance of all necessary educational expense, but should include specific resources for the first year and a knowledge of probable resources for the second and third years.

The Committee on Scholarships and Financial Aid of the Duke Divinity School will gladly counsel with the student concerning possible resources. It is the expressed goal of the Committee to assist the student to secure all needed financial assistance so that upon graduation the student will have a minimum of indebtedness.

Remembering that there are no unlimited resources, it is therefore imperative that the seminary, the church, and the student practice the principles of Christian stewardship in the use of funds for theological education. This entails an appreciative knowledge of the sources, an understanding of the conditions under which financial assistance can be made available, and the wise and unselfish use of these funds.

The primary purpose of a financial aid program is to provide assistance, within limits, to students who demonstrate financial need. Financial need is defined as the difference between the total cost of attending a particular institution and the amount of resources available to the student. Financial assistance may consist of scholarships, loans, tuition grants, grants-in-aid, and employment which may be worked out in various combinations on a year-to-year basis, with reapplication and review each year.

Students are expected to be able to finance themselves for the first semester of work in the Divinity School. Those who show that they can carry their school work satisfactorily and who demonstrate need are then eligible to apply for various forms of financial assistance as described under III and IV. Financial resources may be any or all of the following:

I. PERSONAL. In order that both the Church and the Divinity School may be able to extend the use of their limited funds to as many students as possible, a student who is desirous of a theological education should be willing to provide insofar as possible for the cost of such education from his own resources. These may

be savings and earnings, gifts from family and friends, and, if married, earnings of spouse and gifts from parents of spouse. In calculating anticipated income, the student first considers his own resources.

Students, who have completed their undergraduate education and/or who have worked several years, prefer to be independent of parental support. This is an admirable trait and should be encouraged. However, if parents are in a financial position to assist, there should be arranged a "man to man" business relationship rather than a "father-son" dependency relationship. The student is now entering upon a calling in which he gives himself, his time, his talent for the cause of Christendom. Others will, of necessity, have to assist in financing the student's seminary education. Therefore, the parents can join with the Church and the School in providing the necessary resources during seminary days.

A married student must calculate his expenses accordingly. In the case of a married student with no children, the spouse is expected to be gainfully employed. The spouse's total earnings are to be considered as part of the total family income.

II. CHURCH. Many local churches and conferences provide gifts and grants for theological education.

In recent years many Methodist Annual Conferences, as well as other denominations, have established Ministerial Training Funds for the purpose of providing grants and/or loans to theological students to help defray the costs of tuition, fees, and other educational expenses. The student makes application to his own church, Annual Conference, Presbytery, or other.

III. THE DIVINIY SCHOOL

A. Scholarships

1. Junior Merit Scholarships. To encourage qualified students of superior promise to pursue their preparation for the Christian ministry a limited number of merit scholarships are available each year for entering B.D. students. These scholarships provide an amount covering full tuition plus up to $700. Merit scholars are accorded priority in the selection of students for the Summer Endowment and Field Education Program.
2. National Methodist Scholarships. Two National Methodist Scholarships, having a cash value of $500 each are made available annually by the General Board of Education of The Methodist Church to two outstanding students in the first year class. Awards are granted by the General Board of Education upon the recommendation of the faculty.

Students receiving these awards are required to participate in a two-weeks' expense paid travel seminar during which they visit and study all of the boards and agencies of The Methodist Church located in Nashville, Chicago, New York City, Washington, and Philadelphia.

3. Middler Academic Scholarships. Each year two men are selected to receive Middler Academic Scholarships in the amount of $500. These awards are based on academic excellence and leadership potential.
4. Senior Honor Scholarships. Each year a limited number of honor scholarships are awarded to rising seniors who have achieved academic excellence and who give unusual promise of service in the pastoral ministry.
5. Foreign Student Scholarships. In cooperation with the Crusade Scholarship Committee of The Methodist Church and other authorized church agencies students are selected and are admitted to courses of study. Scholarships for such students are provided from the Lewis Clarence Kerner Scholarship Fund and from individual Methodist Churches and friends.

B. Tuition Grants. These in varying amounts, commensurate with need, are available upon application to the Committee on Scholarships and Financial Aid. Currently enrolled students who are eligible for consideration must apply in November or December prior to the academic year for which a tuition grant is requested. Entering students may apply when admitted. Those whose applications are received prior to February 1 should receive notice of the Committee's action not later than February 20. Those whose applications are received after February 1 will be notified as rapidly as their cases can be reviewed. All applicants should understand that tuition grants will vary in amount and are subject to review either at the initiative of the student or that of the Committee on Scholarships and Financial Aid.

C. Grants-in-aid. A Grant-in-Aid is made available through the Divinity School to a student who chooses to make participation in the Endowment and Field Education Program an integral part of his seminary training. The grant is made for the express purpose of defraying educational expenses. The student must evidence a sincere desire to: (1) Make the required preparation. (2) Make the experience one of learning and self improvement as well as service, under the guidance of the Committee on Endowment and Field Education, the pastor, and the faculty supervisor.

The primary source of Grants-in-Aid is the Duke Endowment, which has as one of its beneficiaries the *rural* Methodist Churches of the two North Carolina Methodist Conferences.

The overall program has been expanded through the use of limited funds (other than Duke Endowment) to include urban and out-of-state churches. The Duke Endowment funds provide the *only* source of Grant-in-Aid for Student Pastors. The Grant-in-Aid program includes the following:

1. Summer Assistant Pastors: Students may apply during the fall semester (November) requesting approval to participate in the Summer Endowment and Field Education Program as Assistant Pastors. Upon request of churches, students are assigned to serve 10 weeks (or five, by special agreement) and in return they receive their room and board for the period of service and grants-in-aid up to $800. Married students whose wives work must be prepared to go without their wives. A limited number of entering students can be assigned; however, prior consideration is given to rising Middler and Senior students. Students transferring to another seminary are not eligible for assignment the summer prior to transfer.

   Address correspondence to: Endowment and Field Education Committee, Box 4814, Duke Station, Durham, N.C.

2. Winter Assistant Pastors: Any student who is not serving as a student pastor, may be assigned to serve as a part-time assistant in a local church or related agency during the period of the regular academic year, September through May. Applications for such assignments must be made to the Endowment and Field Education Committee at least thirty days in advance of the opening of the autumn semester each year. Students assigned to these positions agree to engage in a specified number of hours of field service each week and in turn they receive grants-in-aid in varying amounts. Assistant pastors and those doing special work are expected to keep their daily travel as low as possible. (Note additional statement in Section on Field Education.)

3. Student Pastors: The Divinity School does not appoint pastors to churches but serves as the liaison agency between the church and the student. The Director of Field Education, or his representative, advises with students regarding opportunities for pastorates and in turn offers information and recommendations to church officials regarding students who are eligible to be assigned to pastorates. No student can

serve as a student pastor without the written approval of the Director of Field Education. Salaries and other forms of support are arranged by church officials in keeping with denominational policies and are reported to the Divinity School.

Student Pastors may be enrolled for not less than eight or more than 12 hours of academic work in any given semester. (See page 36.)

If the charge being served is located beyond 50 to 55 miles from the campus, the students are required to live in Durham or vicinity during the academic work week, Monday 2 P.M. through Friday, 4 P.M. Correspondence concerning a student pastorate should be addressed to: Director of Field Education, Box 4353, Duke Station, Durham, N.C.

IV. Loans: Loan Funds held in trust by the University, as well as Methodist Student Loans and funds supplied by the Federal Government through the National Defense Education Act of 1958, are available to qualified students.

Loans generally mature after the borrowers have left the University. Loan interest on long term loans from University funds accrues at the rate of 1% from the date of each note. After a student has left the University permanently the loans begin bearing interest at the rate of 3% per annum. The balance unpaid after five years bears interest at the rate of 6% per annum.

Loan applications must be submitted not later than July 1 preceding the academic year for which assistance is requested and must be approved by the Committee on Scholarships and Financial Aid.

Note: Unless otherwise indicated all correspondence concerning financial aid should be directed to: Financial Aid Office, The Divinity School, Box 4814, Duke Station, Durham, N.C. All applications will be reviewed by and all financial aid approved by the Committee on Scholarships and Financial Aid.

V. Employment: There are a number of opportunities during the academic year for part-time non-church employment on the Duke Campus and in the City of Durham. Students or wives needing this type of employment must make their own arrangements with employers and must plan their work schedules so as not to be denied full participation in the educational and cultural opportunities of the Divinity School.

Students or wives desiring employment with the University should apply to the Director of Personnel, 01 Allen Bldg., Duke Station, Durham, North Carolina.

Field Education

ITS Nature and Purpose. Field Education is conceived to have a two-fold nature. (1) It is a vital part of the total education of the theological student, assisting him in understanding the nature and task of the church and in testing his motivation and fitness for the vocation of the ministry. (2) It is a symbol of a mutual relationship between the seminary and the local church, and it is an effective way of declaring and implementing the purpose of the seminary to serve the church as well as the student.

More specifically it is the purpose of Field Education to: (1) assist the student in understanding the nature and task of the local church; (2) study some of the practical problems involved in the care of the parish; (3) afford an opportunity for the progressive development of the student's knowledge and ministerial skills through responsible participation in the life of the church; (4) contribute leadership to churches in the region.

Types of Field Education. (1) Student Pastors, appointed by conferences or other official agencies of a recognized denomination. A student must have the approval of the Director of Field Education, as the agent of the Dean, before accepting an appointment as a student pastor. All students serving in this program must secure credit for Practicum I. (2) Winter assistant pastors, assigned by the Director of Field Education, in consultation with the pastor and/or other leaders of local churches, to serve during the academic year. (3) Other church-related positions, such as teaching church school classes, counseling youth groups, etc. (4) Summer assistant pastors under the Endowment and Field Education Program. This is a program of ten weeks' service in Methodist rural charges of North Carolina, under the appointment and supervision of the Director of Field Education, in cooperation with District Superintendents and pastors. All students serving in this program must secure credit for Practicum II and participate each year in the preparatory training sessions, planned by the Duke Endowment Student Association in collaboration with the Director of Field Education.

Supervision. Through the coordinated efforts of the Divinity School, the local churches, District Superintendents, and pastors there is continuous supervision of all students participating in the Endowment and Field Education Program. Under the general direction of the Director of Field Education, members of the administrative and teach-

ing staff as well as graduate students share in administering this program.

Supervision is carried on through: (1) Practicum I, required in the first semester of service as a student pastor, and Practicum II, required of all students working in the Summer Endowment and Field Education Program; (2) Regular visits by supervisors to charges served by student pastors and assistant pastors, followed by student-supervisor conferences; (3) Seminars (one day) for supervisors; (4) Regular reports from all students and charges to the Endowment and Field Education Office.

The Time Element of Field Work. (1) While the student pastor carries a reduced academic load (see page 36) his divinity studies provide his chief concern and occupation. The amount of time given to parish responsibilities is necessarily limited. (2) It is expected that students serving as assistants during the academic year will be limited ordinarily to 12 to 15 hours of field service per week. A more extensive responsibility beyond such a number of hours will require the student to reduce his academic load. (3) Students serving as church school teachers, youth counselors, and in similar positions are ordinarily expected to devote no more than 3 to 6 hours to this service per week.

Scholarship Resources

CERTAIN special funds have been established, the income from which is used to provide financial aid through scholarships and grants-in-aid for students wishing to secure training in preparation for the Christian ministry. The resources listed below include endowed funds and sources of annual contributions.

R. Ernest Atkinson Legacy

In 1952, under the will of the Reverend R. Ernest Atkinson of Richmond, Virginia, a member of the Trinity College Class of 1917, a sum of money was given to the Divinity School, the income to be used for the benefit of the School.

Mary Reynolds Babcock Foundation Scholarships

Through the generosity of the Mary Reynolds Babcock Foundation of Winston-Salem, North Carolina, a limited number of scholarships in an amount not exceeding $1,400 per year are granted to students in candidacy for the B.D. degree, on nomination and decision of the Dean and Committee on Scholarships and Financial Aid.

E. M. Cole Fund

In 1920 Mr. Eugene M. Cole, a Methodist layman, of Charlotte, North Carolina, established the E. M. Cole Fund, the proceeds from which are to be used in providing assistance for ministerial students.

The Duke Endowment

Among the beneficiaries of the Duke Endowment are the rural Methodist Churches of the two North Carolina Conferences. Under the Maintenance and Operation Program grants-in-aid are available for Duke Divinity School students to serve as assistant pastors under the Endowment and Field Work Program.

N. Edward Edgerton Fund

In 1939 Mr. N. Edward Edgerton of Raleigh, North Carolina, an alumnus of Duke University of the Class of 1921, a member of the Board of Trustees of the University, established the N. Edward Edgerton Fund. The award is limited to students who are candidates for the B.D. degree.

Thomas Jefferson Finch Scholarship

In 1955 Mr. George Davis Finch, '24, and Mr. Brown Faucette Finch, '54, established an annual scholarship in the amount of $650 a

year in memory of Mr. Thomas Jefferson Finch, Trinity College Class of 1884, who was the father and grandfather of the donors.

The James A. Gray Fund

In 1947 Mr. James A. Gray of Winston-Salem, North Carolina, presented the fund, which bears his name, to the Divinity School for use in expanding and maintaining its educational services in behalf of North Carolina churches and pastors. From this fund three scholarships are awarded; two in city church work, and one in rural church work. The Divinity School Seminars and a number of scholarships in the School for Supply Pastors are also supported by income from this gift, as well as the James A. Gray Lectures.

P. Huber Hanes Scholarship

Mr. P. Huber Hanes of Winston-Salem, North Carolina, an alumnus of Duke University of the Class of 1900, has established for Duke University an annual scholarship fund, a portion of which is used to provide financial assistance for Divinity School students.

George M. Ivey Scholarship Fund

This fund was established December 8, 1948, by gift of George M. Ivey, of Charlotte, North Carolina, an alumnus of Duke University of the Class of 1920, the income to be used for scholarship aid for deserving students in the Divinity School.

Lewis Clarence Kerner Scholarship

This scholarship fund was established May, 1959, by Beatrice Kerner Reavis, of Henderson, North Carolina, in memory of her brother, Lewis Clarence Kerner. The income from the principal of this fund is designated for the assistance of native or foreign-born students preparing for service in world Christian missions.

Laurinburg Christian Education Fund

This fund was established December 11, 1948, by gift through the Methodist College Advance Fund, the income to be used for scholarship aid for worthy students of the Divinity School.

Myers Park Scholarship Fund

The Myers Park Scholarship Fund was established in 1948 by contributions of the members of the congregation of the Myers Park Methodist Church, Charlotte, North Carolina, the income to be used for the benefit of the Divinity School.

W. R. Odell Scholarship

In 1946 the Forest Hills Methodist Church, Concord, North Carolina, established a scholarship fund in memory of W. R. Odell, for many years a member of the Board of Trustees of the University.

JESSE M. ORMOND SCHOLARSHIP FUND

In 1948 the North Carolina Conference established a fund in honor of Professor Jesse M. Ormond, who for many years was Director of Field Work in the Divinity School and Professor of Practical Theology.

GILBERT T. ROWE MEMORIAL SCHOLARSHIP FUND

The Gilbert T. Rowe Memorial Scholarship Fund was established through the generosity of Divinity School Alumni and friends of the late Gilbert T. Rowe. The interest on this fund is employed annually for a limited number of senior honor scholarships. Rising senior students with exceptional records and promise of usefulness in the Christian ministry are eligible for grants under this scholarship program.

ELBERT RUSSELL SCHOLARSHIP

In 1942 the Alumni Association of the Divinity School established a scholarship fund in honor of Elbert Russell, late Dean of the Divinity School and for a number of years Professor of Biblical Theology.

HERSEY E. SPENCE SCHOLARSHIP

In 1947 the Steele Street Methodist Church of Sanford, North Carolina, established a scholarship fund in honor of Professor Hersey E. Spence, a former pastor of the congregation, the income to be used for scholarship aid to deserving students of the Divinity School.

THE METHODIST CHURCH

The Methodist Church makes a substantial contribution to the Divinity School by designating a certain percentage of its World Service offerings to the school.

The North Carolina and the Western North Carolina Conferences direct a certain percentage of their College Sustaining Funds to the Divinity School. The South Carolina Conference is a contributor to the Divinity School operational income.

The General Board of Education makes available annually two National Methodist Scholarships having a cash value of $500 each. (See pages 60-61.)

Local Methodist churches throughout the Southeast make contributions to the scholarship funds of the Divinity School, thus making it possible to assign students under the Endowment and Field Work Program to urban and out-of-state churches.

THE METHODIST COLLEGE ADVANCE

The Divinity School was a participant in the North Carolina Methodist College Advance with askings of $200,000 for scholarship

aid and extension of the School's service to ministers. Many local churches and individuals have shared in the raising of this significant sum. Specific contributions are the Henry Harrison Jordan Loan Library, the James A. Gray Fund, the J. M. Ormond Fund, the Laurinburg Christian Education Fund, the Hersey E. Spence Fund, and the Myers Park (Charlotte, North Carolina) Methodist Church Fund.

Dempster Graduate Fellowships

The Methodist Board of Education offers each year the Dempster Graduate Fellowships for graduates of Methodist Theological Schools, who are engaged in programs of study leading to the degree of Doctor of Philosophy in Religion with a view to teaching in Methodist colleges and seminaries. Several Divinity School graduates have held these fellowships.

The Summer Session of the Divinity School

Summer, 1965

Class enrollments will be controlled as occasion may arise so as to secure a fairly even distribution among the courses offered in each term.

FIRST TERM: (Registration June 12—Classes begin June 14 and end July 17)

124 (DS). MORAL THEOLOGY IN THE TWENTIETH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of William Temple and selected contemporary theologians. 11:00-12:20. 3 s.h. HARMON SMITH

195 (DS). ORIGINS OF DOGMATIC THOUGHT.—An analysis of dogmatic concepts in the Gospel of John: their development into a body of doctrine. 7:40-9:00. 3 s.h. HERZOG

261 (DS). THE THEOLOGY OF JOHN WESLEY.—A study of the development and structure of Wesley's theology, with special reference to his doctrines of man and salvation. 9:20-10:40. 3 s.h. RICHEY

SECOND TERM: (Registration July 19—Classes begin July 20 and end August 24)

16 (DS). CONTEMPORARY WESTERN CULTURE.—An analysis of the conceptual commitments in contemporary styles of thought and life as reflected in the natural sciences, philosophy, social analysis, and the arts. 9:20-10:40. 3 s.h. POTEAT

140 (DS). THE RISE OF METHODISM AND THE ANGLICAN BACKGROUND.—The Methodist societies within the Church of England to the death of Wesley. 11:00-12:20. 3 s.h. BAKER

170 (DS). INTRODUCTION TO PASTORAL COUNSELING.—The philosophy and techniques of formal counseling through discussions of textual and interview material. 7:40-9:00. 3 s.h. GOODLING

SCHOOL OF FORESTRY

Fall semester begins September 23, 1965

Spring semester begins February 3, 1966

Forestry in Duke University

DUKE UNIVERSITY, located at Durham, North Carolina, comprises Trinity College, the Woman's College, the College of Engineering, the Graduate School of Arts and Sciences, and the professional schools of Forestry, Divinity, Law, Medicine, and Nursing. The University dates from 1838, when Union Institute was founded in Randolph County by the Methodists and Friends. In 1851 the institution became Normal College, one of the first schools in America for the training of teachers. In 1859 the name was changed to Trinity College and so continued until 1924, when the College became a part of Duke University.

By virtue of an indenture of trust, executed December 11, 1924, by James Buchanan Duke, a great benefaction was placed at the disposal of humanity by providing for hospitalization, church work in rural communities, and education. The principal feature of the educational provision was the creation of Duke University.

The University, with a student body of over 6,700, occupies two campuses. The Woman's College campus of 108 acres was formerly the campus of Trinity College. About a mile west are the new units of the University, known as the West Campus, totaling 467 acres. It was first occupied in September, 1930.

Forestry in Duke University began early in 1931 when the Duke Forest was placed under intensive forest management and forestry research was initiated. An academic-forestry curriculum, designed for students intent upon pursuing the study of forestry as a profession, was organized in Trinity College of Duke University in 1932. This program was enlarged in 1952 and now includes more than 60 cooperating colleges and universities.

In 1938 the School of Forestry was organized at the graduate level and a curriculum was offered leading to the degree Master of Forestry. Work leading to the degree Doctor of Forestry has been offered since 1940. The School has been fully accredited since its origin. A degree in technical forestry at the undergraduate level is not offered at Duke University.

Graduates of recognized colleges and universities, and professional schools of forestry, and other men who meet the entrance requirements of the School, may enroll for training in technical forestry leading to the professional degrees, Master of Forestry and Doctor of Forestry. The Graduate School of Arts and Sciences also offers graduate work

in certain aspects of forestry leading to the degree Master of Arts and Doctor of Philosophy. This work is available to graduates of schools of forestry of recognized standing, and to college or university graduates holding a Bachelor's degree with their major work in appropriate subjects.

Students taking undergraduate work and who are planning to matriculate in the School for programs of study leading to the degrees Master of Forestry or Doctor of Forestry should refer to the section in this announcement where entrance requirements are presented.

Educational Facilities

The School of Forestry is housed in the south wing of the Biological Sciences Building on the West Campus. The programs of the School provide for classroom, laboratory, and field instruction in the fundamental disciplines of forestry and wood science. Specialized training may be elected in forest management, forestry and/or forest products, business management, forest economics, silviculture, silvics, forest entomology, forest biometry, forest pathology, mensuration, forest soils, tree physiology, forest hydrology, forest climatology, wood anatomy, timber physics, chemistry of wood, harvesting and processing, and several other areas in forest products technology.

General and research laboratories are provided for routine and original studies in all of the subject matter fields. These laboratories are equipped with instruments and facilities for quantitative evaluation of biological materials and processes. Greenhouses immediately adjacent to the Biological Sciences Building and the nearby Duke Forest offer excellent facilities for biological investigations in controlled and natural environments. An IBM 7072 Digital Computer system (with supporting 1401 system), housed in the Physics Building, is available for processing research data.

Facilities of allied departments of the University are also available for advanced work in biochemistry, chemistry, economics, genetics, mathematics, plant anatomy, plant ecology, plant pathology, and plant physiology

West Virginia Pulp and Paper Company has made available to Duke University a field headquarters for work in the forests of the South Atlantic Coastal Plain. This camp, located 18 miles northwest of Summerville, South Carolina, is used as a base for field instruction in timber harvesting, wood utilization, soils, silviculture, and forest management.

The School periodically sponsors conferences and symposia on industrial forest management and other technical and scientific sub-

jects. These offer the current viewpoints of many outstanding individuals in both forestry and in allied fields.

The University library, with nearly 1,650,000 volumes and about 4,000,000 manuscripts, provide exceptional resources and facilities for study and research by undergraduate and graduate students, and by visiting scholars. About 60,000 volumes are added annually, while 150 foreign and domestic newspapers and over 7,000 periodicals are received currently. Large collections of microfilms of rare books, newspapers, and periodicals are also available.

The Biology-Forestry library (81,258 volumes), Chemistry library (20,984), Physics-Mathematics library (27,740) are housed for convenience of use in the buildings of these departments. The libraries of the Schools of Divinity (114,740), Law (134,424), Medicine (67,088), and of the College of Engineering (33,203) are also shelved in the buildings of these schools, all on the West Campus.

The Duke Forest

The Duke Forest, of approximately 7,000 acres, is particularly well situated for field work. A five-minute walk from the campus will take one well into many parts of the area, while even the most distant portions can be reached by automobile in about twenty minutes.

Short-term research projects are conducted on the Forest by graduate students in forestry, botany, zoology, and other disciplines. More extensive problems are investigated by the faculty with student assistance, segments of which may be used by students for observation, analysis, and interpretation. Many of these studies serve admirably as instructional material. The Forest provides additional instructional material, as well as demonstrations on an operational scale, of advanced forest practices developed at Duke and elsewhere.

The Forest lies in Durham and Orange Counties near the eastern edge of the Piedmont Plateau. A cross-section of much of the woodlands in the upper coastal plain and lower Piedmont of the Southeast is represented on the Forest with its variety of topography, soil, forest conditions, and patterns of past land use. Elevations range from 280 to 760 feet. The soils are derived from such diverse parent material as metamorphic rock of the Carolina slate formation, granite, Triassic sedimentary rock, and basic intrusives. Nearly one hundred tree species are represented. Some eighteen miles of improved woods roads make all parts of these woodlands readily accessible. It serves as an outdoor laboratory for instruction in forestry and allied fields, and as an experimental forest for research in problems of timber growing and in the sciences basic thereto. It is also used to demonstrate methods of silviculture and forest management applicable to the region.

At few other places in America are there provisions for extensive field study and research in forestry literally at the door of a large university. This natural outdoor laboratory, so conveniently located and representative of the region, is a most valuable supplement to the instructional, laboratory, and library facilities of Duke University.

Forest Sciences Laboratory

The establishment of the Forest Sciences Laboratory research facility of the United States Forest Service's Southeastern Forest Experiment Station in the Research Triangle Park near Durham provides an unusual opportunity for complementing the research programs of students in the School of Forestry. Specialized research projects in forest entomology, pathology, physiology and soils are currently under way at the Laboratory. The research staff of the Laboratory is available for consultation, participation in seminars, and service on graduate committees of students in the School of Forestry. Arrangements may also be made for students to conduct certain aspects of their research at the Laboratory.

Requirements for Admission to the School of Forestry

THE admission requirements of the School of Forestry for work toward the MASTER OF FORESTRY degree presuppose that an applicant is either:

1. A graduate of a professional school of forestry, or
2. A graduate of a college or university of high standing, but without prior professional training in forestry, or
3. A student who has successfully completed the pre-forestry curriculum of one of the colleges cooperating with the School in the academic-forestry training program.

Each applicant must present a certified transcript of his academic record showing the courses he has taken, the number of credit hours he has earned and the grades received. The total number of quality points* must be at least two and one-half times the total credit hours to meet the minimum scholastic standards required for admission to the School. An applicant also must have satisfactorily completed undergraduate work in minimum amount as follows:

One year of biology, including at least one semester of botany; or one year of botany.

One year of chemistry.

One course each in physics and the principles of economics.

Mathematics, through college algebra and trigonometry.

It is urged that an applicant without professional training in forestry present additional credits in the above subjects and in one or more of the following disciplines: soils, geology, mineralogy, petrology, climatology, surveying, languages (particularly German and French), sociology, political science, philosophy, psychology, and zoology.

An applicant who is a graduate of a professional school of forestry will present a certified transcript of his scholastic record showing the attainment of a degree. Before registering for the first semester of residence, the students will be required to select the branch or branches of forestry in which they wish to concentrate the major part of their work and to prepare their proposed programs in conference

* Grades for each hour of college are valued in quality points as follows: "A," 4 points; "B," 3 points; "C," 2 points; "D," 1 point; and "F," no points.

with an appropriate faculty advisory committee. Ordinarily, graduates of a fully accredited school of forestry should be able to meet all requirements for the Master of Forestry degree in one full school year of resident study; others may require a longer period of residence.

Students must make application for admission in advance of the opening of the school year. Those students entering without acceptable courses in forest surveying and aerial photo interpretation, forest mensuration, and dendrology must take the work in these subjects in the Summer Session, and are required to submit their applications prior to May 1. Students entering with advanced standings in these courses should make application before September 1. Application blanks will be sent upon request made to the Dean of the School of Forestry.

Admission to the School of Forestry for a program of study and research leading to the degree, DOCTOR OF FORESTRY, is granted to a student who has received the degree, Master of Forestry, or its equivalent, from a school of forestry of recognized standing, and who has achieved an average of three quality points per hour of credit in his previous graduate studies.

An applicant must file a formal application for admission together with transcripts of his undergraduate and graduate academic records. In his application he should clearly state the branch of forestry in which he desires to concentrate, and if possible, the specific research.

The Committee on Admissions of the School of Forestry, together with the prospective student's major advisor, will determine if the qualifications of the applicant meet entrance requirements.

GRADES. Grades in the School of Forestry are as follows: *E* (exceptional); *G* (good); *S* (satisfactory); *F* (failing) and *I* (incomplete).

An *I* (incomplete) indicates that some portion of the student's work is lacking, *for an acceptable reason,* at the time the grades are reported. The instructor who gives an *I* for a course specifies the date by which the student must have made up the deficiency, in no case more than one calendar year from the date the course ended. If the course is not completed, the grade of *F* is entered upon the student's record unless his appeal to the Dean for the grade *No Credit* is approved.

A grade of *F* in any course normally occasions withdrawal from a degree program.

Requirements for the Degree of Master of Forestry

THE requirements for the degree of Master of Forestry (M.F.) are governed by the extent of the student's previous professional training. Normally, students who have earned the degree of Bachelor of Science in Forestry, or equivalent, from an accredited school of forestry may complete the requirements for the M.F. degree in one academic year. Students who have had no prior professional training in forestry are required to complete one summer session and two academic years of resident study. Graduate work of equivalent grade done in residence at other institutions may, with the approval of the Faculty, be accepted as credit toward the degree, but a minimum of one year of residence at Duke University is required.

The submission of a thesis for the M.F. degree usually is required. With the approval of the Faculty, an acceptable report on a special study may be submitted in lieu of a thesis, credit for which will not exceed three semester hours. Four copies of the thesis, typewritten and bound in accordance with regulations set forth by the Faculty, must be deposited with the Dean of the School of Forestry on or before May 15 of the academic year in which the student expects to obtain the M.F. degree.

A student who has not completed his thesis while in residence must submit an acceptable manuscript to the faculty within a period of two years following the termination of his residence.

No student may take less than fourteen nor more than eighteen semester hours of credit per semester without special permission of the Faculty.

POST-PROFESSIONAL PROGRAM

Students with satisfactory undergraduate professional training qualify for advanced study and research in the various disciplines of forestry under this program. A specific study plan is developed for each student through consultation with a faculty advisory committee. For the student planning a managerial career in the general area of forest production or in forest products technology (and where the Master of Forestry is planned as a terminal degree), these study plans usually consist of courses and seminars with a major portion of the work concentrated in the areas of the student's interests. For the

student with research interest, the study plan is oriented within the subject matter field of interest toward the furtherance of a research career, or toward preparing him for academic training beyond the master's level.

A number of senior-graduate courses offered in other departments of the University are open to qualified students in the School of Forestry. One or more of these may be included in a student's study plan when deemed advisable by his advisory committee.

A minimum of thirty semester credit hours, in which the student must earn a grade of E or G in at least nine hours, are required for the degree, Master of Forestry, under this program. Normally, 15 hours of credit (including thesis) must be earned in the School of Forestry.

POST-LIBERAL ARTS AND SCIENCES PROGRAM

A student who has had no prior professional training in the areas of specialization offered in the School of Forestry is required to begin his studies with a summer term of twelve weeks. Two full academic years of study in addition to the work of the Summer Session are required under this program for the attainment of the degree, Master of Forestry. Any student who does not earn a grade of E or G in at least nine hours of work in the first academic year will not be permitted to enter into the work of the second year.

SUMMER SESSION

	S.H.
Dendrology (F. 141)	3
Forest Surveying and Aerial Photo Interpretation (F. 150)	4
Forest Mensuration (F. 151)	4

FIRST YEAR

Fall Semester	S.H.	*Spring Semester*	S.H.
Forest-tree Physiology (F. 201)	3	Harvesting and Utilization of Forests (F. 212)	3
Forest Entomology (F. 230)	3	Harvesting and Forest Products Field Seminar (F. 218)	1
Silvics (F. 243)	3	Forest Pathology (F. 223)	3
Forest Soils (F. 261)	3	Forest Policy (F. 276)	2
Forest Economics (F. 270)	3	Forest Biometry (F. 250)	3
Theory and Practice of Silviculture (F. 244)	3	Wood Anatomy (F. 290)	3
		Forest Management (F. 281)	3

SECOND YEAR

During the latter part of the second semester of the first year each student will be requested to designate the subject matter field (or

fields) he wishes to pursue in the second year. Those who successfully complete the work of the first year will be assigned a faculty advisory committee who, in consultation with the student, will develop his study plan in a manner identical with that described under the Post-Professional Program.

FORESTRY BUSINESS MANAGEMENT AND FOREST PRODUCTS BUSINESS MANAGEMENT PROGRAMS

Specialized programs are offered in the School of Forestry, in cooperation with the Department of Economics and Business Administration, to meet the need for forestry graduates well grounded in the principles of economics and well versed in the managerial process. These programs require two calendar years of study and training leading to the degree Master of Forestry and are open to selected students who have already earned the Bachelor's Degree in general forestry, forest management, forest utilization, or wood science and technology and who have demonstrated leadership qualities indicative of potential administrative and executive capacity.

The general requirements of the programs are as follows:

1. Approximately 30 semester hours in courses in economics and business administration or in closely allied fields.
2. Approximately 15 semester hours concentrated in the areas of forestry related to the individuals undergraduate background.
3. Experience as a paid managerial trainee with a cooperating forestry or forest products company or business for a period embracing the included summer and fall semester of the second year.
4. A written analysis of some phase of the managerial operation of the company with which the training period is spent.

A specific program of study, commensurate with each student's academic background and future goals, will be developed by the program Advisory Committee in consultation with the student. A sample of suggested courses included in such programs, and admission application forms are available from the Dean of the School of Forestry.

Requirements for the Degree of Doctor of Forestry

THE degree Doctor of Forestry (D.F.) is a professional and research degree conferred on those students who have satisfactorily completed specified requirements of advanced study and research. Although course work is a necessary part of a student's program, the mere accumulation of course credits will not be sufficient for the attainment of this degree. The granting of the D.F. degree is based primarily upon the student's thorough knowledge of a specialized field of study and upon the production of an acceptable dissertation embodying the results of original research.

Work toward the D.F. degree, consisting of advanced studies in a major and a minor field, is offered with majors in the following branches of forestry: forest economics, forest entomology, forest management, forest mensuration, forest pathology, forest soils, forest-tree physiology, silvics, silviculture, forest biometry, forest hydrology, forest climatology, wood anatomy, timber physics, wood chemistry, and forest utilization. A minor may also be elected in any of these branches of forestry or in other areas of specialized study in the University approved by the faculty of the School of Forestry. Prospective students should correspond with the Dean of the School of Forestry on all matters pertaining to admission to the School.

PROGRAM OF STUDY: A committee consisting of at least four members, including a major advisor, will be appointed by the Dean to supervise the work of each student. The major advisor will serve as Committee Chairman.

The student, in consultation with the advisory committee, will prepare a proposed program of study and research. After acceptance by the Committee, it will be presented to the Faculty of the School of Forestry for final approval. If in the judgment of the Committee the student's prior training is inadequate, he may be required to remedy such deficiencies by taking certain undergraduate courses as prerequisites to continued graduate study, but which will carry no graduate credit.

The program will consist of courses, seminars, arranged work and research, approved for graduate credit by the faculty of the School of Forestry. Satisfactory completion of a minimum of 30 semester hours of formalized academic work in which the student must attain

a grade of E or G in at least 12 hours is required of all prospective candidates. Credit hour requirements for the major and minor fields are determined by the Committee. The student's program of study necessarily demands substantial concentration on courses in his major department. A minor, if elected, will consist of at least 12 semester hours, part or all of which may have been included in the program for the Master's degree. If a minor is not elected, a minimum of six semester hours in a single subject matter area outside the major field must be included in the program of study.

FOREIGN LANGUAGES: A reading knowledge of two foreign languages is required. Normally these will be French and German. Spanish or another foreign language may be substituted for either French or German when deemed advisable by the Committee. The foreign language examinations will be conducted by the appropriate language departments of Duke University. At least one of the language requirements must be met during or before the student's first regularly enrolled semester at Duke University. Students not able to comply with this regulation will be required to reduce their maximum allowable load in succeeding semesters by 3 semester hours until the first language requirement has been met. The second language requirement must be met before the student is permitted to take the comprehensive preliminary examination. Enrollment in non-credit language courses at Duke University will be considered a part of the student's maximum allowable load in any one semester.

LANGUAGE EXAMINATIONS: On Monday of the fall registration period and on the day before spring registration, reading, vocabulary, and grammar tests in French and German are offered (see the Calendar for hour and place). Any entering student who has not taken these tests may do so. On the basis of his scores the student will (1) be certified as meeting requirements in these languages, (2) be advised to present himself for the regular reading examinations at the first opportunity, or (3) be advised to enroll in the special reading courses.

READING EXAMINATIONS: Reading examinations in French and German are offered on those dates listed in the Calendar. Reading examinations in other languages must be separately arranged.

Students requiring the reading examination at other times must pay a special fee of $5.00 prior to registering in the Graduate Office for the examination. Students who require re-examination at scheduled times will be charged $5.00 for each re-examination; if special times are necessary, the fee will be $10.00.

COMPREHENSIVE EXAMINATION: At least six months before the student expects to receive the D.F. degree, and after he has completed most of his formal course work, he will be required to take a

comprehensive examination. The examination will be written in subject areas specified by the Committee and may be followed by an oral examination given by the Committee. The decision as to whether the examination has been passed or failed is the responsibility of the Committee.

PRIVILEGE OF RE-EXAMINATION: Should the student fail the comprehensive examination, he may apply, with the consent of his supervisory committee and of the Dean of the School of Forestry, for the privilege of a second examination to be taken no sooner than three months after the date of the first. Failure on the second examination will render the student ineligible to continue his program for the D.F. degree at Duke University.

Upon satisfactory completion of the comprehensive examination the student will be considered a candidate for the D.F. degree.

RESIDENCE REQUIREMENTS: The minimum period of study beyond the M.F. degree, or its equivalent, is two years of academic work of which at least two regular semesters must be spent in full-time study on the campus in Durham. Graduate work of a fragmentary nature taken over a period of several years will not meet this requirement. Course work of equal grade taken at another college or university of approved standing may, with approval of the Faculty of the School of Forestry, be accepted in partial fulfillment, but shall not exceed 15 semester hours of the total requirements. Such transfer of credit may not under any circumstances be used to reduce the two regular semesters of full-time study which must be spent at Duke University. Course work taken under the cooperative interchange-of-registration plan between the graduate schools of Duke University and the Consolidated University of North Carolina is considered the same as work taken on the campus in Durham.

A student who has successfully completed the 30 hours of required formalized study, met the language requirements, and passed the comprehensive examination, may, with the approval of his supervisory committee and the Dean of the School of Forestry, continue his research and complete his dissertation *in absentia.* Under this arrangement he is required to register for one hour of research credit each semester until the degree has been awarded.

A student who remains in residence after passing the preliminary examination must register for a minimum of three semester hours of research credit each semester unless his course-seminar registration is at least nine hours, in which case the 3-hour registration requirement is waived.

DISSERTATION: In addition to obtaining adequate training in the field of his specialty, the student must demonstrate his ability to plan and conduct sound, original research. Evidence of this ac-

complishment must be presented in the form of an acceptable dissertation embodying the results of original work, which is a definite contribution to knowledge. Course credit is not granted but students must register for dissertation research.

The subject of the dissertation must receive the approval of the Faculty, and the title must be filed with the Dean of the School of Forestry on or before October 15 of the academic year in which the candidate desires to take his final examination.

The dissertation will normally be submitted for acceptance within two calendar years after passing the preliminary examination. Should it not be submitted within four calendar years after the examination, the candidate may, with the approval of his committee, petition the Dean of the School of Forestry for an extension of one year.

If the dissertation is not submitted and accepted within five years after the examination, the candidate must pass a second preliminary examination. Following the second examination, the student's doctoral committee will determine possible additional requirements and set time limits within which the dissertation must be completed and accepted.

After the dissertation has been approved by the major advisor, and at least 10 days prior to the date set for the final examination, the candidate is required to deposit with the Dean of the School of Forestry the original and three typewritten and temporarily bound copies together with 10 copies of an abstract of the dissertation consisting of not more than 600 words. Following acceptance of the dissertation by the Committee, the student will deposit with the Dean of the School of Forestry on or before April 15 of the academic year in which the student expects to obtain the D.F. degree, the original unbound copy of the dissertation together with three carbon copies (also unbound) and 10 copies of the approved abstract. The first carbon copy will be deposited in the University Library, the major advisor will receive one copy, and the fourth copy will be returned to the student. The original copy will be sent to University Microfilms, Ann Arbor, Michigan, where it will be reproduced and published on microfilms. Later the original will be returned to Duke University where it will be bound and deposited in the University Library.

The basic requirements for preparing the dissertation are described in the *Manual of Style for Theses and Dissertations* which may be obtained from the Duke University Book Store, West Campus. Additional instructions concerning the microfilming, preparation of title page and the abstract should be obtained from the Dean's office.

At the time the final approved copies of the dissertation and the abstract are deposited with the Dean of the School of Forestry, the

candidate must show evidence of having paid a fee of $25.00 to the Bursar of the University to cover the costs of microfilming.

FINAL EXAMINATION: The final examination will be in defense of the candidate's dissertation and on related subject matter. It will be oral and will be conducted by the advisory committee. At least six months must elapse between the dates of the preliminary and the final examinations.

Forestry in the Graduate School of Arts and Sciences

MAJOR and minor work is offered in several disciplines of forestry leading to the A.M. and Ph.D. degrees, which are administered by the Graduate School of Arts and Sciences. Work for these degrees may be pursued only in forest-tree physiology, wood anatomy and properties, forest pathology, silvics, forest soils, forest biometry, forest climatology, forest entomology, and forest economics. Students who have had specialized training in botany or soil science and in allied basic subjects, such as physics, chemistry, geology, and zoology, may pursue graduate study and research only in the specialized fields for which their previous work has qualified them.

Applicants for admission to the Graduate School must ordinarily have made not less than a "B" average in their undergraduate work, and must not have concentrated excessively in one field of study to the detriment of a rounded program. They should have met substantially the requirements for the A.B. or B.S. degree at Duke University.

In addition to fulfilling the usual requirements for admission, the applicant must satisfy the Director of Graduate Studies in Forestry as to his liberal arts training, as well as to his preliminary training in the field of forestry.

For detailed information concerning admission to the Graduate School, and for regulations governing candidacy for the A.M. and Ph.D. degrees, language requirements, residence requirements, and other regulations concerning these degrees, the student should consult the *Bulletin* of the Graduate School of Arts and Sciences.

Tuition, Fees, and Expenses

THE following table shows the general fees and charges collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration and no student is admitted to classes until arrangements have been made with the Bursar of the University for the settlement of fees.

General Fees

Tuition, per semester	$525.00
General Fee, per semester	$ 72.50
Spring field seminars	$ 10.00
Absentia Fee, per semester (when applicable)	$ 40.00

Forestry students may obtain admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of an athletic fee of $15.00 per year plus any Federal taxes that may be imposed. This fee is payable in the fall semester.

TRANSCRIPTS: A student is entitled to one free transcript of his academic record. A charge of one dollar is made for each additional copy.

PAYMENTS TO FELLOWS AND SCHOLARS: Payments by the University of stipends to fellows and scholars are made in eight monthly installments, beginning October 20. Fellows and scholars are required to pay the regular tuition fee and such additional fees as are ordinarily required of all graduate students.

Living Accommodations

The Men's Graduate Center is available to men of the graduate and professional schools. It contains bedroom facilities for four hundred men, complete with lounges, study rooms, recreational rooms, post office and dining hall. The rooms are equipped for two persons and the rental charge for a double room in $500.00 for the academic year, or $250.00 for each occupant, or $125.00 for each occupant each semester.

Rooms are rented for the academic year, but for no period of less than one semester. No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedules.

Room reservations are made through the Housing Bureau only after official acceptance for admission to the University. A $25.00 room deposit is required of each applicant before a room reservation is made. The initial room deposit is effective during the student's residence in the University if attendance is continuous in regular academic years. This deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated.
b. Upon withdrawal from the University, provided written notice is received in the Housing Bureau by August 1, for cancellation of a reservation for the fall semester; and not later than January 15, for cancellation of a reservation for the spring semester.
c. When the reasons requiring withdrawal are beyond the student's control.

No refund is made until the occupant has checked out of his room through the Housing Bureau and has settled all of his accounts with the Treasurer.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of the reservation in accordance with the plan that is published during the school year.

Any exchange of rooms must be arranged at the Housing Bureau. Persons exchanging rooms without the approval of the Housing Bureau will be subject to charges for both rooms.

The authorities of the University do not assume responsibility for the persons selected as roommates. Each student is urged to select his roommate when the room is reserved.

Beds and mattresses (39" x 74"), tables, chairs, dressers, mirrors, and window shades are furnished by the University. The student supplies linens, blankets and pillows. Rugs, totaling not more than 54-square-feet, study lamps and curtains are permissible, and if desired, are furnished by the students.

Duke University Apartments are available to married graduate students. The rental rates per month have been set at $70 for an efficiency apartment, $80 for a one-bedroom apartment, and $90 for a two-bedroom apartment. For further information on apartments for married students, write to the Housing Bureau, Duke Station, Durham, North Carolina.

Duke University desires to provide for its students a residential environment conducive to academic achievement, the development of high ideals, and sound character. The institution asks and believes that each student will cooperate in achieving these aims by arranging his personal belongings in an orderly manner, by caring for the build-

ings and furniture as he would in his own home, and by observing a code based on gentlemanly behavior in an educational environment which demands respect for all residents. Regulations governing the occupancy of rooms will be supplied directly from the Housing Bureau when room reservations are made. Occupants are expected to abide by these regulations.

Firearms (including air rifles) may be brought into the residence halls only upon written permission and registration with the Dean of Men of Duke University.

Dining Service

The dining facilities on the West Campus include three cafeterias with multiple-choice menus, and the Oak Room where full meals and a la carte items are served. The cost of the academic year ranges from $450.00 upward depending on the tastes of the individual.

In the Men's Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge where sodas and sandwiches are served from 11:30 A.M. to 11:00 P.M. The prices in these dining rooms are the same as those on the West Campus.

It is hoped that present rates may be maintained. Charges, however, are necessarily dependent on costs of labor, food, and materials, and some adjustment may be necessary.

Due to the large number of those served in the dining halls, it is not possible to arrange special diets for individual students. Special diet for the sick is served in the infirmary.

Estimated Expenses for an Academic Year

The necessary expenses of a graduate student are moderate. The University dormitories provide thoroughly comfortable and wholesome living conditions at a minimum cost, while all charges made by the University have been kept low. Incidental expenses naturally depend upon the tastes and habits of the individual. The following table summarizes expenses in the School of Forestry for one year:

	Low	Moderate	Liberal
Tuition	$1050.00	$1050.00	$1050.00
General Fees	145.00	145.00	145.00
Room-rent	250.00	250.00	300.00
Board	450.00	500.00	550.00
Laundry	25.00	35.00	45.00
Books	50.00	60.00	70.00
Athletic Fee (optional)	15.00	15.00	15.00
Spring field seminars	10.00	10.00	10.00
	$1995.00	$2065.00	$2185.00

Medical Care

Forestry students who pay at least ⅗ full tuition and fees for the semester or the term of the Summer Session during which illness occurs are eligible under the Student Health Program. They are not covered during vacations and their dependents and members of their family are not covered at any time. Care is provided for men at the Student Health Office in Duke Hospital.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth and of all chronic and pre-existing conditions, and elective surgery.

Forestry students are urged to carry adequate health insurance to supplement Student Health Program service. If students have insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of their medical care. The complete medical facilities of the Duke University Medical Center are available to all members of the University community.

Motor Vehicles

Every motor vehicle operated on the campus by students enrolled in Duke University must be registered at 08 Social Science Building within five days after arrival and thereafter must display the proper decal emblem. To register a vehicle, the student must present the following documents: (1) state vehicle registration, (2) state operator's license, (3) evidence of automobile liability insurance as required by North Carolina law ($5,000 per person, $10,000 per accident for personal injuries; $5,000 for property damage).

All students owning motor vehicles and living in a University dormitory are required to pay an annual parking rental fee of $30.00.

Student Activities

Forestry students new to Duke University are reminded that they are welcome to use such recreational facilities as swimming pools, tennis courts, golf course, and to affiliate with choral, instrumental, drama, and religious groups.

Students are encouraged to maintain broad professional contacts by participation in the activities of the Society of American Foresters, the Forest Products Research Society, the national honorary scientific

society of Sigma Xi, and other societies appropriate to their major field of study.

The social and business events of the Forestry Club provide opportunities for many pleasant extracurricular activities. An active organization of the wives of forestry students offers a regular schedule of social occasions of interest to this group.

University Counseling Center

The University maintains a Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. In addition, the Bureau administers special group testing programs for University schools and departments and serves as the local testing center for a wide variety of national testing programs. The Bureau also carries on programs of research in the field of measurement and counseling.

Appointments Office

Duke University maintains an active Appointments Office which has steadily been placing students in teaching, governmental and industrial positions. The services of this office are available without charge to graduate students. Those who are interested in securing employment through the Appointments Office, or those who wish to have available for their own use in securing employment a complete file containing their academic record and pertinent recommendations, should register in this office.

Financial Aid

Fellowships, Scholarships, and Assistantships

A NUMBER of fellowships, scholarships, and assistantships are allocated to the School of Forestry for the encouragement and financial assistance of men who offer promise of becoming leaders in the forestry profession. These are awarded to applicants of high character on the basis of scholastic ability as judged by previous educational performance, professional experience, personal references and the Graduate Record Examination.

Holders of the awards will pay tuition and such additional fees as are regularly required.

The awards are of three classes:

FELLOWSHIPS: From five to eight fellowships, with stipends ranging from $1500-$2500 per academic year. Each recipient must have previously completed work equivalent to that required at Duke University for a Master's degree with a major in forestry or in a discipline basic to forestry. He will devote his time to an approved program of study and research in any of the branches of forestry. He is expected to become a candidate for the degree of Doctor of Forestry or Doctor of Philosophy.

SCHOLARSHIPS: From fifteen to eighteen scholarships with stipends ranging from $1250-$2000 per academic year. Each recipient will normally devote his time to an approved program of study leading to the degree of Master of Forestry, or Master of Arts with a major in forestry.

GRADUATE ASSISTANTSHIPS: One to several graduate assistantships with variable stipends up to $3600, depending upon available funds and upon whether granted for the academic year only, or the academic year plus the summer. Each recipient will devote half-time to research or other work of the School of Forestry. He will be permitted to enroll for not more than 20 semester hours in an academic year in an approved program of study, or study and research, leading to a degree of Master of Forestry, Master of Arts, Doctor of Forestry, or Doctor of Philosophy.

Two $3200 research assistantships, one in Forest Pathology, one in Forest Entomology, sponsored by the Southern Forest Disease and Insect Research Council, are available to qualified candidates.

Three industry-sponsored stipends are also awarded annually to qualified scholars. These are: *The Koppers Company, Inc. Scholarship* of $1600.00; and *The Brunswick Pulp and Paper Company Fellowship for Research in Hardwood Silviculture* of $2000.00, and *The Lilly Company Scholarship* of $1600.00.

APPLICATION FOR AWARDS: Any student admitted to the School of Forestry is eligible to apply for a fellowship, a scholarship or an assistantship. Application for these awards may be made concurrently with the application for admission.

The general procedures and requirements for applying for any financial award in the School of Forestry are outlined below. Applicants should initiate the necessary action early to insure that the required documents are filed with the Dean of the School of Forestry on or before March 1 prior to enrollment.

1. File award application. Form will be supplied by the School of Forestry on request.
2. Furnish supporting documents as follows:
   a. Official transcripts of record of all previous college or university credits earned.
   b. Letters of reference from at least three persons familiar with the applicant's character, scholarship, and professional ability.

(Documents offered in support of admission, if so designated, may also serve in support of the application for financial award.)

3. Complete the Aptitude Test of the Graduate Record Examination. Instructions and application for admission to this locally administered examination are available on most college campuses, from the Duke School of Forestry, or by writing the Educational Testing Service, Princeton, New Jersey. Applicants should plan to take this examination in January or earlier.

Notification of awards is made on April 1. In case vacancies occur, completed applications received after March 1 will be considered at a later date.

In every instance where a graduate assistantship, scholarship, or fellowship for the next academic year is offered to an actual or prospective graduate student and accepted before April 15, the accepter may resign his appointment without prejudice prior to that date by notification in writing to the Dean. However, an acceptance given or left in force after April 15 obligates him not to accept another appointment without first obtaining formal release from the Dean of the School.

Student Loans

Students who have completed at least one semester in residence and who have satisfactory academic and citizenship records are eligible to apply for student loans. Loan funds held in trust by the University as well as funds supplied by the federal government through the National Defense Education Act of 1958, are available to qualified students.

Loans from university funds generally mature after borrowers have left the University. Interest accrues on long-term loans from University funds at the rate of one percent per annum from the date of each note. After a student has left the University permanently, the loans begin accruing interest at the rate of three per cent per annum.

In addition to local loan funds, Duke University participates in the student loan program established under the provisions of the National Defense Education Act of 1958. Repayment of these loan funds normally begins one year after the student terminates his education at the University. Interest accrues at the rate of three percent per annum commencing at the time of the first payment, with complete repayment scheduled within a ten-year period. Special benefits to those teaching in the public schools permit a portion of the loan to be cancelled depending upon the length of teaching service. Complete details regarding the student loan program may be obtained by writing directly to the Executive Secretary of the University Scholarship Committee.

The Student Loan Committee in approving loan applications selects those students who, from the standpoint of character, scholastic attainment, personality and degree of financial need, are deserving of this consideration. All applications for loans should be made to the Executive Secretary of the University Scholarship Committee.

Courses and Subjects of Instruction

SCHOOL OF FORESTRY COURSES

IN THE SUMMER SESSION

141. DENDROLOGY.—Nomenclature, classification, and identification of woody plants with special reference to species indigenous to southeastern United States and other important forest regions of temperate North America. Laboratory and field studies in the southern Appalachian Mountains, Piedmont Plateau, and South-Atlantic Coastal Plain. Prerequisite: One year of biology including botany. *Three weeks, eight hours a day beginning June 14, 1965.* 3 s.h. (w)
ASSISTANT PROFESSOR WHITE

150. FOREST SURVEYING AND AERIAL PHOTO INTERPRETATION.—Application of plane surveying to forest problems including the use and adjustment of instruments; boundary, topographic and cover-type surveys; details of land ownership, title and transfer. Principles of aerial photogrammetry and interpretation of photographs for forest mapping and mensuration. Prerequisite: trigonometry; engineering graphics desirable. *Four weeks, eight hours a day beginning July 5, 1965.* 4 s.h. (w) PROFESSOR CHAIKEN

151. FOREST MENSURATION.—Field studies in methods of measuring content and growth of trees and forest stands; practice of timber estimating, log scaling, use of mensurational instruments, and collection of basic data. *Four weeks, eight hours a day beginning August 2, 1965.* 4 s.h. (w) PROFESSOR OSBORNE

REGULAR SESSION COURSES FOR SENIORS AND GRADUATES

201. FOREST-TREE PHYSIOLOGY.—The principal physiological processes of trees, including water relations, synthesis and use of foods, and growth phenomena. Prerequisites: Botany 1-2 or equivalent; one year of chemistry. 3 s.h. (fall).
PROFESSOR KRAMER

212. HARVESTING AND UTILIZATION OF FORESTS.—Principles, procedures, and cost determinations in harvesting timber products with emphasis on managed forests in North America. Processing of wood as a raw material by important forest industries. 3 s.h. (spring). PROFESSOR WACKERMAN

216. LUMBER MANUFACTURE.—Methods of processing logs for sawn products with emphasis on the principles involved in obtaining maximum volume and quality yield for large and small mills; trends in lumber consumption by regions; use of waste for by-products; the development of new lumber products; and industry problems. Prerequisite: Forestry 212 or equivalent. 3 s.h. (spring).
PROFESSOR WACKERMAN

218. HARVESTING AND FOREST PRODUCTS FIELD SEMINAR.—Field studies of the major regional forest products industries; observation and application of harvesting techniques. 1 s.h. (spring). ASSISTANT PROFESSOR WHITE

223. FOREST PATHOLOGY.—Principles of plant pathology with special emphasis on representative forest tree diseases; introduction to forest products pathology. Related field and laboratory studies of regional tree diseases and deterioration of wood products. Prerequisite: Botany 1-2, or equivalent. 3 s.h. (spring). ASSISTANT PROFESSOR STAMBAUGH

230. FOREST ENTOMOLOGY.—Principles of protecting forests from injurious insect infestations; characteristics and identification of insect-caused damage to trees and wood products; identification, biology, and control of the more important tree-infesting insect species. 3 s.h. (fall). PROFESSOR ANDERSON

232. FOREST PRODUCTS ENTOMOLOGY.—Study of the characteristics and

identification of various types of injury to wood products caused by insects and other wood-damaging animals; identification, biology, and control of wood-damaging animals. Prerequisite: Forestry 230 or equivalent. 2 s.h. (spring).
PROFESSOR ANDERSON

243.—SILVICS.—Ecological foundations of silviculture with special reference to forest site factors; influence of forests on their environment; growth and development of trees and stands; origin, development, and classification of forest communities; methods of studying forest environments. Desirable prerequisites: plant physiology, plant ecology, and Forestry 261, or equivalents. 3 s.h. (fall).
ASSOCIATE PROFESSOR WOODS

244. THEORY AND PRACTICE OF SILVICULTURE.—Principles governing establishment, treatment, and control of forest stands; natural and artifical methods of reproduction, intermediate cuttings, and cultural operations with emphasis on the principal forest types of temperate North America. Field practice in silvicultural operations and study of managed stands. Prerequisite: Forestry 243 or equivalent. 3 s.h. (fall). ASSOCIATE PROFESSOR WOODS

248. FOREST REGENERATION.—Fundamentals and practices of regenerating forest stands. Genetic control through recently developed propagating techniques; seed handling in the field, and during preparation for use; techniques for large production tree nurseries; the use of heavy equipment, chemicals, and fire for site preparation and timber stand improvement; recent developments in direct seeding and planting. 3 s.h. (fall). ASSOCIATE PROFESSOR WOODS

250. FOREST BIOMETRY.—Statistical methods essential to the collection, analysis, and interpretation of forest data; includes regression and correlation techniques, Chi-square tests of associations, and tests of significance; short-cut computational procedures. Special attention is devoted to the use of statistical techniques in forest administration and mensuration problems. 3 s.h. (spring).
PROFESSOR OSBORNE

251. SAMPLING METHODS IN FORESTRY.—Statistical background for solution of sampling problems with special references to sampling of forest and associated populations. Prerequisite: Forestry 151. 3 s.h. (Not offered 1965-66).
PROFESSOR OSBORNE

257. DESIGN OF FORESTRY EXPERIMENTS AND ANALYSIS OF DATA.—Role of experimental design in field and laboratory, and statistical analysis of data as aspects of the scientific method in forestry research. 5 s.h. (Not offered 1965-66).
PROFESSOR OSBORNE

261. FOREST SOILS.—Origin, development, and classification of soils with special emphasis on those developed in humid climates; morphological, physical, and chemical properties of soils in relation to growth of trees; effect of forests on soils. Prerequisites: Chemistry 1 and 2, and Physics 1, or equivalent; physical geology, mineralogy, petrology, and analytical chemistry are also desirable. 3 s.h. (fall).
PROFESSOR RALSTON

270. ECONOMICS OF FORESTRY.—Development of the principles of economics useful in the analysis of the past, present, and prospective supply and demand situations for forestry goods and services; problems of the economics of the firm and industry basic and peculiar to forestry, with special attention to the time dimension of value; the role of forestry in the general economy including attention to relevant institutional factors. Prerequisite: at least one course in the principles of economics. 3 s.h. (fall). PROFESSOR YOHO

272. MARKETING FOREST PRODUCTS.—Methods of selling and distributing lumber, timber, and other important forest products in domestic and foreign trade; trade-association functions; regional competition for markets; and transportation problems. Prerequisites: Forestry 212 and 270 or equivalent. 2 s.h. (spring). PROFESSOR WACKERMAN

276. FOREST POLICY.—Objective study and analysis of the development of public land and forestry policies in the United States, present policies of public and private forestry organizations, and current policy issues in the light of economic and other criteria. Prerequisite: Forestry 270. 2 s.h. (spring). PROFESSOR YOHO

281. FOREST MANAGEMENT.—Principles of organizing forest properties for systematic management, use of data obtained in surveys and inventories; principles of forest regulation, including a study of normal and actual forests, rotations, cutting cycles, and methods of regulating the cut in even-aged and all-aged forests for sustained yield; introduction to the preparation of preliminary forest management plans. Prerequisites: Forestry 150, 151, or equivalents. 3 s.h. (spring). PROFESSOR CHAIKEN

283. FOREST PROTECTION.—Impact of destructive agencies upon forests; principles of combustion, fire behavior, danger measurement and suppression; use of fire in forest management. 3 s.h. (fall). PROFESSOR CHAIKEN

285. FOREST-GAME MANAGEMENT.—Principles of management for the sustained production of desirable game and fur animals on forest land; characteristics and biology of important species. 2 s.h. (spring). PROFESSOR ANDERSON

286. FOREST-RANGE MANAGEMENT.—Principles of livestock management by which sustained maximum use can be obtained from forest grazing lands. 2 s.h. (spring). PROFESSOR ANDERSON

290. WOOD ANATOMY.—Study of the physical features and the gross and minute structural characteristics of wood leading to the identification of the commercial woods of the United States, and the important tropical woods used in American wood-working industries. Prerequisites: one year of biology including botany; Forestry 241 or equivalent. 3 s.h. (spring). PROFESSOR HARRAR

291. WOOD-MOISTURE RELATIONS.—Physical principles underlying the response of wood to moisture and its removal; the concept of equilibrium moisture content. Principles and methods involved in drying lumber and other wood products as a step in preparing them for use. Prerequisites: Forestry 212, and 290 or equivalents. 2 s.h. (fall). PROFESSOR WACKERMAN

292. MICROTECHNIQUE OF WOODY TISSUE.—Preparation of wood for microscopic study including sectioning, staining, and mounting techniques; elementary photomicrography. Prerequisite: Forestry 290 or equivalent. 3 s.h. (fall). PROFESSOR HARRAR

293. WOOD PRESERVATION.—Principles, methods, and materials used in treating wood to increase its durability, service-life, and fire resistance. Prerequisites: Forestry 212 and 290, or equivalents. 2 s.h. (fall). PROFESSOR WACKERMAN

295. SURFACE GENERATION IN WOOD.—Directed energy systems; physics of edges; details of wood surface generating machinery; surface generation in relation to wood anatomy; physical measurement of wood surfaces. Prerequisites: For. 290 or equivalent, calculus. 2 s.h. (fall). ASSISTANT PROFESSOR SULLIVAN

296. CHEMISTRY OF WOOD.—Nuclear, atomic and molecular force systems; chemical composition and distribution of chemical components in wood; interaction of wood and moisture; macro-chemical reactions of wood and other cellulosic systems including degradation reactions. Prerequisites: Forestry 290 or equivalent, calculus, organic chemistry. 3 s.h. (fall). ASSISTANT PROFESSOR SULLIVAN

297. WOOD PHYSICS (MECHANICS).—A study of the reaction of wood to mechanical forces; the derivation of working properties and their variance; experimental and standard testing procedures; introduction to theories of elasticity and plasticity; theories of failure; anatomical and moisture effects. Prerequisites: Forestry 290 or equivalent, calculus, college physics, statistics. 3 s.h. (fall) ASSISTANT PROFESSOR SULLIVAN

201A. to 297A. SPECIAL STUDIES IN FORESTRY.—Work on the same level as the foregoing Senior-Graduate courses to meet the needs of individual students. Credit and hours to be arranged. THE STAFF

FOR GRADUATES

301 (fall), 302 (spring). ADVANCED STUDIES IN FORESTRY.—Credits to be arranged. To meet individual needs of graduate students in the following branches of forestry:

A. SILVICS.—Prerequisites: Forestry 241, 243, and 244 or equivalents. ASSOCIATE PROFESSOR WOODS

B. FOREST SOILS.—Prerequisite: Forestry 261 or equivalent.
PROFESSOR RALSTON

C. SILVICULTURE.—Prequisites: Forestry 244, 245, and 246 or equivalents.
ASSOCIATE PROFESSOR WOODS

D. FOREST MANAGEMENT.—Prerequisite: Forestry 281 or equivalent.
PROFESSOR CHAIKEN

E. FOREST ECONOMICS.—Prerequisite: Forestry 270 or equivalent.
PROFESSOR YOHO

F. PROPERTIES OF WOOD.—Prerequisites: Forestry 241, and 290 or equivalents. PROFESSOR HARRAR AND ASSISTANT PROFESSOR SULLIVAN

G. FOREST MENSURATION AND BIOMETRY.—Prerequisites: Forestry 250, and 352 or equivalents. PROFESSOR OSBORNE

H. FOREST ENTOMOLOGY.—Prerequisite: Forestry 230 or equivalent.
PROFESSOR ANDERSON

I. FOREST UTILIZATION.—Prerequisite: Forestry 212 or equivalent.
PROFESSOR WACKERMAN

J. DENDROLOGY.—Prerequisite: Forestry 141 or equivalent.
PROFESSOR HARRAR AND ASSISTANT PROFESSOR WHITE

K. FOREST-TREE PHYSIOLOGY.—Prerequisites: Plant physiology, plant ecology, and silvics. PROFESSOR KRAMER

L. FOREST PATHOLOGY.—Prerequisites: Plant physiology and Forestry 223 or equivalents. ASSISTANT PROFESSOR STAMBAUGH

M. FOREST CLIMATOLOGY AND HYDROLOGY.—Prerequisites: Forestry 341, 342, or equivalents. ASSISTANT PROFESSOR KNOERR

312. COST AND QUALITY CONTROLS IN FOREST UTILIZATION.—Principles and methods of obtaining greatest efficiency of operations and maximum product value in harvesting and processing forest products; factors governing the relation of tree size to net stumpage values; and the application of these principles and methods in the solution of actual case problems. Prerequisites: Forestry 212 and 270 or equivalents. 3 s.h. (spring). PROFESSOR WACKERMAN

321. RESEARCH TECHNIQUES IN FOREST PATHOLOGY.—Fundamental phytopathological methods employed in field and laboratory investigations of tree disease pathogens. Literature review and discussion of current developments. Prerequisite: Forestry 223, or equivalent. 3 s.h. (fall).
ASSISTANT PROFESSOR STAMBAUGH

331. TOXICOLOGY OF INSECTICIDES.—Study of the physical, chemical and biological properties of materials used to destroy insects. Formulation, toxicology and insect physiology as related to insecticide action are emphasized. Prerequisite: one course in entomology; organic chemistry is recommended. 3 s.h. (spring).
PROFESSOR ANDERSON

332. ECOLOGY OF FOREST INSECTS.—Study of the environmental factors as they influence insect population development. Both the physical and the biotic aspects are considered on the basis of field and laboratory experimental methods. Prerequisite: Forestry 230 or equivalent. 3 s.h. (fall). PROFESSOR ANDERSON

333. MORPHOLOGY AND TAXONOMY OF FOREST INSECTS.—Principles of insect structure, classification and nomenclature; laboratory work concentrated on the collection, preservation and identification of both the adult and immature stages of various forest insects. Prerequisite: Forestry 230 or equivalent. 3 s.h. (fall). PROFESSOR ANDERSON

341. FOREST METEOROLOGY.—The science of meteorology, including microclimatology, as it is related to forest biology and hydrology; emphasis is on physical laws governing exchange of heat and moisture in the climatic environment. Prerequisite: One year of college physics; calculus desirable. 3 s.h. (fall).
ASSISTANT PROFESSOR KNOERR

342. FOREST HYDROLOGY.—The influence of forests and other vegetation on local climate, the hydrologic cycle, and soil stability; relationships to water

yield, floods, and erosion. Prerequisite: One year of college physics; calculus desirable. 3 s.h. (spring). ASSISTANT PROFESSOR KNOERR

344. MICROMETEOROLOGY.—Physics of the earth's surface environment with emphasis on plant and animal microclimate: budgets of mass, momentum and energy; vertical structure of wind, temperature, and water vapor in relation to exchange processes within the biosphere; local circulation and eddy diffusion. Principles in micrometeorological measurement. Prerequisites: Forestry 341; calculus desirable. 3 s.h. (spring). ASSISTANT PROFESSOR KNOERR

347, 348. SEMINAR IN SILVICS.—Advanced topics in silvics are discussed and current research papers and reports are reviewed, analyzed, and evaluated. Prerequisite: Forestry 244 or equivalent. 2 s.h. (fall and spring).
ASSOCIATE PROFESSOR WOODS

352. ANALYSIS OF FOREST MEASUREMENTS.—Empirical equations and curve fitting appropriate to forestry data; functional relationships among experimental responses; useful mathematical models for forestry populations; selected non-parametric analysis methods. Prerequisites: Forestry 250 or Mathematics 233 or equivalents. 3 s.h. (spring). PROFESSOR OSBORNE

353. SAMPLING AND EXPERIMENTAL DESIGN IN FORESTRY.—Theory and application of selected sampling designs to forestry populations. Includes multi-stage and multi-phase designs; acceptance and sequential sampling; regression, ratio, and double sampling; sampling with variable probability of selection. Construction and analysis of designs for forestry experiments. Prerequisites: Forestry 250 or Mathematics 230 or equivalents. 3 s.h. (fall). PROFESSOR OSBORNE

357. (fall), 358. (spring). RESEARCH IN FORESTRY.—Credits to be arranged. Students who have had adequate training may do research under direction of members of the Faculty in the branches of forestry indicated under courses 301, 302 with the same prerequisites as thereunder noted; each branch to bear the same letter designation as under courses 301 and 302. STAFF

362. FOREST SOIL PHYSICS.—Analysis of the physical properties of soil related to the growth and development of forest trees. Consideration is given to the significance of soil moisture, temperature, aeration, and structural characteristics in the analysis of forest growth relationships. Prerequisite: Forestry 261. 3 s.h. (spring). Offered in alternate years with Forestry 366. PROFESSOR RALSTON

364. SOIL CLASSIFICATION AND MAPPING.—Classification of soils as natural bodies. Mapping of soils, land use classes and forest site classes; field study will be made of soils in either the coastal plain or mountains. Prerequisite: Forestry 261. 3 s.h. (spring). PROFESSOR RALSTON

366. FOREST SOIL FERTILITY.—The relationships of soil fertility factors in the growth of forest trees. Emphasis placed on the analysis of soil factors related to the mineral nutrition of trees. Prerequisite: Forestry 261; analytical chemistry is recommended. 3 s.h. (spring). (Not offered 1965-66). PROFESSOR RALSTON

368. FIELD SEMINARS.—Field studies, consultations, and visits to areas of interest during spring vacation period, or at other times, in the several branches of forestry listed under Forestry 301-302. Credits to be arranged. THE STAFF

378. SEMINAR IN FOREST ECONOMICS.—Examination and discussion of the application of economic concepts in forestry, the potential contribution of economic analysis to private and public forest management; current research in forest economics. Prerequisites: Forestry 270 and 379 or consent of the instructor; advanced courses in economics and economic theory are desirable. 2 s.h. (spring).
PROFESSOR YOHO

379. ECONOMIC ANALYSIS IN FORESTRY.—A critical exploration of static and dynamic economic theory including procedures in activity analysis applicable to forestry problems of resource allocation and production combinations, production location and timing; cost structure and asset control; uncertainty and expectations. Special attention to problems in formulating economic projections and forecasts relevant to forestry. Prerequisite: Forestry 270 or consent of instructor. 3 s.h. (fall). PROFESSOR YOHO

386. SEMINAR IN FOREST MANAGEMENT.—Examination and analysis of techniques employed in the management of industrial and public forests, particularly in the South; discussion of problems of large scale intensive forest management. Prerequisites: Forestry 244, 281, and 379 or equivalent. 1 s.h. (spring).
PROFESSOR CHAIKEN

390. WOOD-LIQUID SURFACE INTERACTIONS.—Free surface energy of liquids and solids; theory of adhesion; adhesion for wood substrates; physical and chemical description of adhesives and adhesive joints; wood coatings; physical and chemical properties of surface coating materials. Prerequisite: Forestry 296. 3 s.h. (spring). ASSISTANT PROFESSOR SULLIVAN

392. ADVANCED WOOD PHYSICS.—Theories of elasticity and plasticity; mechanical damping; piezoelectric properties; structure of crystals; fatigue failure. Prerequisites: Forestry 297, Forestry 296, Experimental Design. 3 s.h. (spring).
ASSISTANT PROFESSOR SULLIVAN

398. TROPICAL WOODS.—A study of the properties of various groups of tropical woods with particular emphasis upon those used in marine construction, and for lumber, plywood and furniture. Prerequisite: Forestry 290 or equivalent. 2 s.h. (spring). PROFESSOR HARRAR

399. SEMINAR IN WOOD SCIENCE AND FOREST PRODUCTS.—Application of scientific disciplines to product research and development; wood science in industry. 1 s.h. (spring). PROFESSOR HARRAR AND ASSISTANT PROFESSOR SULLIVAN

OTHER RELATED COURSES

A student in the School of Forestry, may, with the approval of the faculty of the School of Forestry and the Director of Graduate studies of the department concerned, include any of the following courses offered in the Graduate School of Arts and Sciences for which he has had adequate preparation. The student is referred to the *Bulletin* of the Graduate School of Arts and Sciences for the complete descriptive content of each course.

BIOCHEMISTRY AND NUTRITION

Assistant Professor W. L. Byrne, Director of Graduate Studies

	S.H.		S.H.
201. Introductory Biochemistry	4	301. Energy Metabolism	3
203. Chemistry of Natural Products	2	302. Nitrogen Metabolism	2
206. Laboratory Methods in Biochemistry	2	304. Proteins and Enzymes	4

BOTANY

Professor W. Dwight Billings, Director of Graduate Studies

	S.H.		S.H.
202. Genetics	4	256. Community Analysis and Classification	3
203. Plant Cytology	4	257. Principles of Plant Distribution	3
204. Advanced Plant Anatomy	4	258. Physiology of Growth and Development	4
221. Introductory Mycology	4	259. The Environment	3
240. Plant Evolution	3	305. Vegetation of North America	3
252. Plant Metabolism	4		
254. Plant-Water Relations	3		
255. Advanced Taxonomy	4		

CHEMISTRY

Professor C. K. Bradsher, Director of Graduate Studies

	S.H.
206. Elements of Theoretical Chemistry	4
215. Advanced Inorganic Chemistry	3
216. Nuclear Chemistry	2
233. Instrumental Analysis	2
234. Chemical Instrumentation	2
251. Qualitative Organic Analysis	2 or 3
252. Advanced Organic Preparation	2
261-262. Physical Chemistry	8
303. Thermodynamics	3
304. Physical Chemistry of Reactions	3
341, 342. Advanced Organic Chemistry	8
350. Organic Reactions	2
352. Mechanisms of Organic Reactions	1
360. Polymer Chemistry	2

CIVIL ENGINEERING

Professor E. I. Brown, Director of Graduate Studies

	S.H.
CE 201. Theoretical and Applied Mechanics	3
CE 202. Advanced Mechanics of Materials and Experimental Stress Analysis	3
CE 231. Structural Theory and Analysis	3
CE 242. Hydraulic Engineering	3

ECONOMICS AND BUSINESS ADMINISTRATION

Professor R. S. Smith, Director of Graduate Studies

	S.H.
201. Senior Seminar in Economics	3
204. Advanced Money and Banking	3
218. Business Cycles	3
219. Economic Problems of Underdeveloped Areas	3
231. Economic History of Europe	3
233. State and Local Finance	3
237-238. Statistical Methods	6
249. Product Markets	3
262. Trade Unionism and Collective Bargaining	3
268. Competition and Monopoly	3
273-274. Auditing, Theory and Practice	6
275-276. Advanced Industrial Accounting and Management	6
277. Income Tax Accounting	3
278. Advanced Problems in Income Taxation	3
279. Budgeting and Control	3
287. Public Finance	3
290. The Use of Quantitative Methods in Business	3
291. Business Policy	3
293. Economic Systems	3
294. Economic Functions of the State	3
295-296. Advanced Accounting Seminar—Theory and Practice	6
301. Economic Analysis	3
304-305. Seminar—Money and Banking	6
307-308. Quantitative Analysis	6
311-312. History of Political Economy	6
313-314. Seminar—Economic Theory	6
315. Seminar—Economic Systems	3
316. Seminar—Economic Functions of the State	3
317. Seminar—Demographic, Population, and Resource Problems	3
319. Seminar—Theory and the Problems of Economic Growth and Change	3
320. Seminar—Trade Cycles, Employment, and Income Theory	3
321-322. Economic Workshop—Economic Development	6
329. Federal Finance	3
330. Seminar—Public Finance	3
331. Seminar—Economic History	3
340. National Income	3
355. Seminar—Labor Economics	3
358. Seminar—Labor Market and Related Analysis	3
365. Seminar—International Economics	3
366. Seminar—Problems in International Trade and Finance	3

386. Seminar—Latin American Economic Problems 3
388. Seminar—Industrial Organization 3
389. Seminar—Industrial and Governmental Problems 3
401. Seminar—British Commonwealth 3

ELECTRICAL ENGINEERING

Associate Professor Harry A. Owen, Jr., Director of Graduate Studies

S.H.
EE 201. Energy Systems 3

MATHEMATICS

Professor J. H. Roberts, Director of Graduate Studies

S.H.
211. Finite Mathematics 3
212. Mathematical Analysis 3
221. Digital Computer 3
222. Introduction to Numerical Analysis 3
233. Statistical Methods 3
234. Sampling Designs 3
244. Design of Experiments 3
283. Probability for Engineers 3
285. Applied Mathematical Methods I 3
286. Applied Mathematical Methods II 3
291-292. Theory of Functions 6
325-326. Real Variable 6

MECHANICAL ENGINEERING

Professor V. L. Kenyon, Jr., Director of Graduate Studies

S.H.
ME 201. Theoretical and Applied Mechanics 3
ME 202. Theoretical Thermodynamics 3
ME 222. Analysis of Heat Transfer .. 3

PHILOSOPHY

Professor Paul Welsh, Director of Graduate Studies

S.H.
241. Logic 3

PHYSICS

Professor E. G. Greuling, Director of Graduate Studies

S.H.
201-202. Mechanics 6
213-214. Contemporary Physics 6
217-218. Advanced Physics Laboratory 2-6
303-304. Thermodynamics and Statistical Mechanics 6
340. Structure of Matter 3

POLITICAL SCIENCE

Associate Professor Alan P. Sindler, Director of Graduate Studies

S.H.
207. American Constitutional Law and Theory 3
241. Administrative Management 3

SOCIOLOGY

Associate Professor A. C. Kerckhoff, Director of Graduate Studies

	S.H.
233. Rural Sociology	3
246. Public Opinion and Propaganda	3
248. Pressure Groups and Public Relations	3

ZOOLOGY

Associate Professor D. A. Livingstone, Director of Graduate Studies

	S.H.
203. Ecology	4
222. Entomology	4
238. Systematic Zoology	4
245. Radiation Biology	3 or 4
246. Molecular Biology	3 or 4
249. Neural and Hormonal Mechanisms in Invertebrates	4
271. Cellular Physiology	4
274. Invertebrate Zoology	4
276. Protozology	4
278. Invertebrate embryology	4

Cooperative Plan of Study with Selected Colleges and Universities

SINCE its inception the Duke School of Forestry has had the cooperation of Trinity College (the men's undergraduate college of arts and sciences of Duke University) in preparing students for professional careers in forestry. Under the plan, a student devotes his first three years to a coordinated and carefully integrated program of study in the basic arts and sciences in Trinity College. The summer between his junior and senior year and the two following school years are spent in the School of Forestry. Upon the successful completion of this five-year course of study, a student will have earned the Bachelor of Science degree from Trinity College and the professional Master of Forestry degree from the Duke School of Forestry.

Based upon the experience and success of this cooperative program with Trinity College, the School of Forestry in 1952 initiated similar programs of collaboration with a selected group of colleges and universities located throughout the United States. These programs offer students the numerous advantages of a broad background in liberal arts and sciences as preparation for later professional training. A student intent upon following such a course of study should make application to one of the colleges listed. Admission requirements and other information pertinent to matriculation may be obtained from each of these institutions. Not later than the end of the first semester of the third year in the college or university of his choice, the student may make formal application for admission to the Duke School of Forestry. To qualify for admission under these programs, a student must have followed a planned course of study arranged in consultation with his advisor, must have the official recommendation of his college, and must meet the minimum requirements for admission to the Duke School of Forestry.

Institutions Cooperating with the School of Forestry in the Academic-Forestry Program

ALABAMA

Howard College ..... Birmingham 35209

COLORADO

Colorado College ..... Colorado Springs 80903

FLORIDA

Florida Southern College ..... Lakeland 33802
Rollins College ..... Winter Park 32791
Stetson University, College of Liberal Arts ..... Deland 32720

GEORGIA

Mercer University ..... Macon 31207

ILLINOIS

Illinois Wesleyan University, College of Liberal Arts ..... Bloomington 61710

INDIANA

Butler University, College of Liberal Arts and Sciences ..... Indianapolis 46207
Indiana Central College ..... Indianapolis 46227

IOWA

Iowa Wesleyan College ..... Mount Pleasant 52641

KANSAS

Baker University ..... Baldwin 66006

KENTUCKY

Kentucky, University of, College of Arts and Sciences ..... Lexington 40506

LOUISIANA

Centenary College of Louisiana ..... Shreveport 71104

MARYLAND

Western Maryland College ..... Westminster 21158

MICHIGAN

Albion College ..... Albion 49224

MISSISSIPPI

Millsaps College ..... Jackson 39210

MISSOURI

William Jewell College ..... Liberty 64068

NEBRASKA

Doane College ..... Crete 68333

NEW JERSEY

Drew University, College of Liberal Arts ..... Madison 07940

NEW YORK

Hofstra College ..... Hempstead, Long Island 11550

NORTH CAROLINA

Catawba College ..... Salisbury 28144
Duke University, Trinity College ..... Durham 27706
Guilford College ..... Guilford College 27410
High Point College ..... High Point 27262
Wake Forest College ..... Winston-Salem 27106

OHIO

Baldwin-Wallace College ..... Berea 44017
Capital University, College of Arts and Sciences ..... Columbus 43209
Denison University, A College of Liberal Arts and Sciences ..... Granville 43023
Heidelberg College ..... Tiffin 44883
Kent State University, College of Liberal Arts ..... Kent 44240

Marietta College	Marietta	45750
Miami University, College of Arts and Sciences	Oxford	45056
Ohio University	Athens	45701
Otterbein College	Westerville	43081
Wittenberg College	Springfield	45501
Youngstown University	Youngstown	44503

OREGON

Reed College	Portland	97202
Willamette University, College of Liberal Arts	Salem	97301

PENNSYLVANIA

Albright College	Reading	19604
Elizabethtown College	Elizabethtown	17022
Franklin and Marshall College	Lancaster	17603
Gettysburg College	Gettysburg	17325
Juniata College	Huntingdon	16653
Lebanon Valley College	Annville	17003
Lycoming College	Williamsport	17704
Moravian College	Bethlehem	18018
Muhlenberg College	Allentown	18104
Thiel College	Greenville	16125

SOUTH CAROLINA

Furman University	Greenville	29613
Newberry College	Newberry	29108
Wofford College	Spartanburg	29301

TENNESSEE

Carson-Newman College	Jefferson City	37760
Chattanooga, University of, College of Liberal Arts	Chattanooga	37403
East Tennessee State College	Johnson City	37602
Lincoln Memorial University	Harrogate	37752
Tennessee Wesleyan College	Athens	37303
Tusculum College	Greenville	37743

TEXAS

Baylor University, College of Arts and Sciences	Waco	76706
Southwestern University, College of Arts and Sciences	Georgetown	78626

VIRGINIA

Bridgewater College	Bridgewater	22812
Randolph-Macon College	Ashland	23005
Richmond, University of, Richmond College	Richmond	23173
William and Mary, College of	Williamsburg	23185

WEST VIRGINIA

Davis and Elkins College	Elkins	26241
Marshall College	Huntington	25701
West Virginia Wesleyan College	Buckhannon	26201

WISCONSIN

Beloit College	Beloit	53512

THE GRADUATE SCHOOL OF ARTS AND SCIENCES

Fall semester begins September 23, 1965

Spring semester begins February 3, 1966

General Regulations Governing Graduate Study

Admission

PREREQUISITES. A student seeking admission to the Graduate School of Arts and Sciences of Duke University must have received an A.B. or B.S. degree (or the equivalent in the case of foreign students) from an accredited institution. His undergraduate program should be well rounded and of such quality as to give positive evidence of capacity for graduate study. Normally he should have majored in the area of his intended graduate study. Many departments (see Courses of Instruction, pp. 63 ff.) list specific prerequisites. Students are urged to anticipate at least one of the language requirements (see pp. 27-29).

STUDENTS REQUIRING ADMISSION. Admission is required of 1) all students who intend to pursue study toward a degree offered by the Graduate School, 2) all other students who desire credit for whatever purpose for graduate courses—except students who register as Special Students in the Summer Session. Students who have discontinued a program of study after earning a master's degree here must by letter request permission of the Dean to undertake a doctoral program.

PROCEDURE FOR ALL APPLICANTS. A student seeking admission to the Graduate School should request the Dean of the Graduate School to send an application blank. This he should fill out completely and return promptly. In addition he should provide the following supporting documents: (1) a transcript or transcripts of all his undergraduate and graduate work mailed directly by the registrar to the Dean; (2) as soon as possible, supplementary transcripts showing completion of work in progress when the earlier transcript was made; (3) three letters of recommendation written by persons best qualified to judge him as a prospective graduate student and mailed directly to the Dean; (4) scores on the Graduate Record Examination or Miller Analogies Test as indicated.

All applicants except foreign students applying from outside the United States must include an application fee of $5.00 in check or money order payable to Duke University.

GRADUATE RECORD EXAMINATION AND MILLER ANAL-

OGIES TEST. As additional evidence of capability scores on the Graduate Record Examination, particularly the Aptitude Test, and on the Miller Analogies Test are strongly recommended in all departments and must be submitted if either test has been taken. Scores on the Graduate Record Examination may be requested of any applicant whose record is marginal and must be submitted by all applicants for a fellowship. Departments that require scores of all applicants are listed below:

	Graduate Record Examination		
	Aptitude Test	Advanced Test	Miller Analogies Test
Anatomy	×	×	
Botany	×	×	
Economics	×	×	
English	×	×	
Forestry	×		
Germanic Languages	×		
History	×		
Philosophy	×		×[1]
Physiology	×		
Psychology	×		×
Romance Languages	×	×	
Zoology	×	×	×[1]

[1] Either GRE or MAT.

(Information on times and places of Graduate Record Examinations can be provided at the applicant's college or by the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.)

ADDITIONAL PROCEDURE FOR FOREIGN STUDENTS. Fully qualified students from outside the United States are welcomed in the Graduate School to take courses and in many instances to study toward a degree. In applying for admission the foreign student should, in addition to the information required of all students, submit with his application (1) if his native language is not English, certification of ability to use English such as scores on tests provided by the Educational Testing Service, the University of Michigan Language Institute, or the American University Language Center, (2) a statement certified by a responsible person that his finances are sufficient to maintain him during his stay at Duke University, and (3) a statement by a qualified medical doctor describing any emotional or physical illness the applicant has had during the previous five years.

All foreign students whose native language is not English will be examined during their first registration period for competence in the use of oral and written English. Until competence is determined,

admission and arrangements for an award involving teaching must remain provisional. Students found to lack the necessary competence will be required to enroll in the non-credit course English for Foreign Students and to reduce their course or research program three units if necessary. Passing this examination or the course, if it is required, will not meet degree requirements for a foreign language.

CLOSING DATES FOR APPLICATIONS. Because applications cannot be reviewed until all required supporting documents are filed, applications should be submitted at least *two weeks* before the closing dates listed below:

Fall semester, admission and award	February 15
Fall semester, admission only	August 1
Spring semester, admission only	January 1
Summer Session,* First Term	May 14
Summer Session,* Second Term	June 20

It is the applicant's responsibility to make certain that his application is completed and in order before the dates specified.

NOTIFICATION AND STATUS. When admission is approved, the student will receive a letter of admission and an acceptance form. The process of admission is not complete until the statement of acceptance has been returned.

Applicants who are admitted will be offered full admission, provisional admission, or non-degree admission. *Provisional admission* is offered to students who (1) appear to warrant admission but who do not fully comply with admission requirements, for a trial period of one semester or a minimum of 12 hours of course work, or (2) are admissible except that the application lacks a letter of recommendation, a supplementary transcript, required test scores, or some other required information. *Non-degree admission* is offered to students who (1) have no intention of taking an advanced degree at Duke University but wish to take courses for accreditation, for transfer to other institutions, or for other purposes, (2) do not fully meet admission requirements but wish to further their academic interests, and (3) who apply late and must register before the application can be fully considered. Graduate credit earned under *provisional status* may be applied toward an advanced degree at Duke University if and when upon review the student is granted full admission; graduate credit earned under *non-degree* status may not be applied toward an advanced degree at Duke University. Late applicants ((3) above)

* Students seeking admission to the Graduate School for study in the Summer Session should make application to the Dean of the Graduate School as well as to the Director of the Summer Session.

will be granted full admission if admission can be completed within two weeks of registration.

Registration

WHO MUST REGISTER. (1) All students who enter course work or residence for credit; (2) all students who have completed minimum requirements for an advanced degree, but continue to use the facilities of the University in their research; (3) all students in *in absentia* status; (4) all students who wish merely to audit a course or courses.

REGISTRATION. After the applicant has received notification of his admission to the Graduate School and has returned his statement of acceptance of admission, he may present himself for registration. During the registration periods, announced in the *Bulletin*, he first confers with the Director of Graduate Studies of his major department, who prepares and signs a course card, listing the course work to be taken during the semester. The student then presents this course card to registration officials, who enroll him officially in his courses. After his first registration period as a current student he will pre-register at the stated times for pre-registration. Failure to pre-register incurs the penalty for late registration. *Former students* who intend to register to resume a degree program must give the Department and the Dean notice of this intention two months before registration.

LATE REGISTRATION. All students are expected to register or pre-register at the times stated in the *Bulletin*. Those registering late, including those who are obliged to register *in absentia*, are subject to a *late registration fee of five dollars.*

CHANGE OF REGISTRATION. During the academic year within a period of *fourteen days* from the registration date students may change registration with the approval of the Director of Graduate Studies, if no reduction of fee is involved, and with the approval of the Dean if reduction of fee is involved. Thereafter during the first thirty days from the registration date the only permissible change is dropping course-seminar registration and adding equivalent units of research, with the approval of the Director of Graduate Studies, the instructor of the course, and the Dean.

Grades, Hours, and Credits

Although ideally graduate study is principally individual reading, research, and laboratory experimentation under guidance, academic progress in the United States is generally measured and recorded in

terms of course hours and credits. The term *residence* designates full-time study and research in close proximity to facilities provided for both as opposed to part-time study incidental to a full-time occupation. Here required *residence* of one year is defined as two successive academic semesters of not less than nine units registration each semester. Credit for courses and seminars, research, and residence, and corresponding tuition and fees are stated in terms of units. According to conventional measurement one unit is equivalent to one semester hour.

CREDITS EARNED OUTSIDE THIS GRADUATE SCHOOL

(1) *Graduate Credit Earned before the A.B. Degree Is Granted.* Ordinarily no credit will be allowed for graduate courses earned before a student has been awarded his A.B. or B.S. degree. However, an undergraduate student at Duke University who, at the beginning of his final semester, lacks no more than 9 semester hours of fulfilling the requirements for the A.B. or B.S. degree, may obtain permission from the Dean of the Graduate School to enroll for graduate courses sufficient to bring his total program to fifteen hours a week. Such graduate courses will be credited toward the A.M., M.S., M.Ed., or M.A.T. degree, provided that the student meets the requirements for admission to the Graduate School, and that he is duly registered in the Graduate School at the beginning of the final semester.

Duke undergraduates in the Honors-Masters program provisionally may be granted this type of admission at the beginning of their seventh semester provided that at the beginning of their final semester they will meet the requirement stated above.

(2) *Transfer of Graduate Credits.* Credit for graduate course work earned at another institution will be determined only after a student has spent one semester at Duke University. After completing his first semester, the student through his Director of Graduate Studies should file a request that his credits be reviewed and a decision made.

(3) *Graduate Credit for Courses Taken in the School of Law.* Upon the recommendation of the Director of Graduate Studies, and upon the approval of the Dean of the Graduate School, students in the social sciences may take certain courses in the School of Law for graduate credit. In some instances courses in the School of Law may be considered as fulfilling a student's requirements for a minor. To register for such courses, the student should present a letter from his Director of Graduate Studies to the Dean of the School of Law requesting permission to register for certain specified courses.

(4) *Reciprocal Agreement with the Consolidated University of North Carolina.* Under a plan of co-operation between the Consolidated University of North Carolina and Duke University, students

regularly enrolled in the Graduate Schools of the Consolidated University during the regular academic year, and paying full fees to that institution, may be admitted to a maximum of two courses per semester in the Graduate School of Duke University upon payment of a nominal registration fee of two dollars and of any other special fees regularly required of all students. Under the same arrangements, students in the Graduate School of Duke University may be admitted to course work at the Consolidated University of North Carolina. A similar arrangement is effective in the Summer Session. (See the Summer Session Bulletin.)

GRADES. Grades in the Graduate School are as follows: *E, G, S, F,* and *I*. *E* (exceptional) is the highest mark. *G* (good) and *S* (satisfactory) are the remaining passing marks. *F* (failing) is below passing, and *I* (incomplete) indicates that some portion of the student's work is lacking, *for an acceptable reason,* at the time the grades are reported. The instructor who gives an *I* for a course specifies the date by which the student must have made up the deficiency, in no case more than one calendar year from the date the course ended. If the course is not completed, the grade of *F* is entered upon the student's record unless his appeal to the Dean for the grade *No Credit* is approved. The grade of *Z* indicates satisfactory progress at the end of the first semester of a two-semester course. It will be changed to whatever grade is appropriate upon the completion of the course. A grade of *F* in a major course normally occasions withdrawal from a degree program not later than the end of the ensuing semester or term; a grade of *F* in a minor course occasions academic probation.

COURSES PRIMARILY FOR UNDERGRADUATES. Students granted provisional admission and others whose preparation is found deficient may on occasion be required as part of their program to take undergraduate courses as prerequisites to continued graduate study. Undergraduate courses thus taken and others elected by the student will carry no graduate credit.

In exceptional cases, 100-level courses *outside the major department* may be taken for graduate credit to a maximum of two one-semester courses or one year-course not exceeding a total of 8 units, when approved by the Directors of Graduate Studies in the major department and in the department in which the course is listed and by the supervisor of the program.

NORMAL REGISTRATION. A graduate student is designated as fully registered when he registers for the maximum credit his program requires. Required registration is set in consideration of the student's obligation to teach or assist and the stage he has reached in completion of degree requirements. Normal registration for the resident student who does not hold an appointment as part-time

instructor or assistant is 15 units a semester or 30 units an academic year. The normal registration for the student who holds such an appointment is either 12 units or a minimum of 9 depending upon the number of hours a week he is required to teach or assist.

The resident student in a terminal master's program which requires no thesis carries normal registration until he has met all degree requirements. If a thesis is required and the student has met all requirements except for submitting his thesis, he registers for 3 units a semester while in residence or, if he elects to go out of residence, for 1 unit *in absentia* (a semester) until the thesis is accepted.

The resident student engaged in a master's program which is not terminal but preparatory to a doctoral program registers as though he were a doctoral student.

The resident student in a doctoral program carries normal registration through the semester in which he passes the preliminary examination. Thereafter until the dissertation is accepted he registers for a minimum of 3 units a semester. If he elects at any time to go out of residence, to keep his program active he registers for 1 unit a semester *in absentia*.

The registration of 1 unit a semester *in absentia* is not considered full registration and does not provide access to library carrel, laboratory space, or Student Health but does permit occasional consultation with the thesis or dissertation supervisor. It may be waived for military duty or serious problems of health. Master's candidates subject to the fee for submitting a thesis in the academic year may credit the 1-unit fee to this charge.

In the Summer Session 6 units a term is maximum registration. Students resident in the academic year who wish to continue study and use of University facilities including Summer Session Student Health during the summer must register for 1 unit in the first Summer Session term. This registration provides use of these facilities for both terms.

WITHDRAWAL AND INTERRUPTION OF PROGRAM

From a Course. For permissible changes during the first thirty days after the registration date, see Change of Registration, page 23. If a course is dropped without the necessary approval, the permanent record will list the course as *Dropped Unofficially, F.* If a course is dropped after the thirty-day period, the status of the student at the time of withdrawal from the course will be determined and be indicated on the permanent record as *Withdrew Passing (W.P.) or Withdrew Failing (W.F.).*

From the Graduate School. The University reserves the right, and matriculation by the student is a concession of this right, to request the withdrawal of any student whose conduct at any time is not satis-

factory to the University, even though no specific charge be made against the student. If a student wishes for any reason to withdraw from the Graduate School, he should notify both the Director of Graduate Studies in his major department and the Dean of the Graduate School prior to the date of his expected withdrawal.

Students who find it necessary to interrupt their program of study for a period longer than a summer vacation should, before departure, leave with the Graduate Office a statement of the reason for interruption, mailing address, and expected date of return. If they are subject to registration *in absentia*, they should arrange for such registration before departure.

A foreign student who after successfully completing a minimum of one semester's graduate study must withdraw for the purpose of returning home before the completion of a graduate program may with the approval of his major department request the Dean to issue him a Certificate of Graduate Study.

TRANSCRIPT. A student who wishes to transfer his credits from Duke University to another institution is entitled to one free transcript of his record. A fee of one dollar, payable in advance, is charged for each additional copy. Requests are directed to the Central Records Office.

SIZE OF CLASSES. Classes which carry graduate credit are limited in size to thirty students. In exceptional cases this regulation may be modified, but only by permission of the Executive Committee of the Graduate School Faculty on the recommendation of the department concerned. When courses numbered 200 to 299 carry graduate credit, they may include no more than three juniors and such juniors must, at the time of registration, have an over-all B average.

Language Requirements

Because a requirement for the A.M. degree is mastery of one acceptable foreign language, and for the Ph.D. is mastery of two, the prospective graduate student should attain mastery of at least one acceptable foreign language and preferably two before applying for admission. The facilities for graduate study are highly specialized and costly. The student who must lay them aside to acquire what he could have learned as an undergraduate is wasting his time.

To prevent delay in meeting this requirement, students whose programs call for mastery of French, Spanish, or German and who have studied the language must take the objective screening examination at their first registration period.

ACCEPTABLE LANGUAGES. The languages normally required are French, German, and Russian, but with the approval of the Dean of the Graduate School, a student may substitute for any one of these another language which has a definite relation to the candidate's program of work for the degree and for which an examination can be provided.

MEETING THE REQUIREMENTS. Language requirements may be met before, during, or after first registration here in the following ways:

BEFORE FIRST REGISTRATION

1. BY TRANSCRIPT. With the permission of the Dean of the Graduate School and of the chairman of his program committee or of the Director of Graduate Studies, the doctoral student may file a transcript or other certification as evidence of having passed a comparable examination at another graduate institution. The limitations are that 1) only one of the two doctoral requirements may be met in this way, 2) the other institution offers a doctoral program in the student's major and that the examination would have met a doctoral requirement there, and 3) the examination was passed no more than five years before first registration here.
2. BY ETS SCORES. The Educational Testing Service Graduate School Foreign Language tests in French, German, and Russian are offered at many centers including Duke University Counseling Center upon nationally uniform dates. Scores on these tests taken elsewhere not more than five years before first registration here may be offered to meet the master's degree requirement of one language or the doctoral requirement of two.

AT FIRST REGISTRATION

On Monday of the fall registration period and on the day before spring registration, objective reading, grammar, and vocabulary tests in French, German, and Spanish are offered (see the Calendar for hour and place). Any entering student in the master's or doctoral program may take them. On the basis of his scores the student will be 1) certified as meeting requirements in these languages, 2) advised after review to present himself for the ETS tests (French, German) or the locally-prepared reading test in Spanish, or 3) advised to enroll in the special reading course (see below).

AFTER FIRST REGISTRATION

1. Students who first registered in September 1964 and thereafter and who wish to be examined in French, German, or Russian

will take the ETS tests. For Spanish they will take the locally-prepared reading test.

2. Students who began a program before September 1964 may take either the ETS test or the locally-prepared reading tests in French, German, Russian, Spanish, and, upon request, Italian.

Reading examinations in other languages must be individually arranged. Each ETS examination requires a fee of $8. The student who requires a re-examination in the locally-prepared reading examination at scheduled times will be charged $5 for each re-examination; if special times are necessary, the fee will be $10. Examinations at special times cannot be offered in French and Spanish.

SPECIAL READING COURSES. Special courses designed to assist graduate students in acquiring a reading knowledge of French or German are offered for three hours a week, French during the fall semester, German during the spring semester and the Summer Session. A student who registers for either course must reduce his normal load of graduate courses by three units, with no reduction in fees. *No auditors* are permitted in these courses at any time. Undergraduates may not enroll during the academic year and may, with permission of the Dean of the Graduate School, in the Summer Session only if total registration permits.

REQUIREMENTS FOR FOREIGN STUDENTS. Foreign students whose native language is not English are, during their first registration period, required to take a test for minimum competence in English. Such students, with the approval of the Director of Graduate Studies in their major department, may request permission of the Dean of the Graduate School to substitute English for *one* of the required foreign languages in the doctoral program. If permission is granted, an additional reading test in English will be arranged.

Degrees Offered

THE DEGREES OFFERED. The Graduate School of Arts and Sciences now offers the following degrees: Master of Arts (A.M.), Master of Science (M.S.), Master of Education (M.Ed.), Master of Arts in Teaching (M.A.T.), Master of Hospital Administration (M.H.A.), Doctor of Philosophy (Ph.D.), and the Doctor of Education (Ed.D.)

General Regulations Governing Master's Degrees

RESIDENCE REQUIREMENTS. Candidates for all Master's degrees must spend, as a *minimum*, one full academic year, or its equivalent in Summer Session terms, in residence at Duke University. (See p. 24.) Those who wish to complete their degrees wholly in the Summer Session must be in residence for five terms. Often more time will prove necessary in either case, depending upon the nature of the student's research problem if a thesis is offered and upon the student himself.

A Master's degree *without thesis* requires a *minimum* of 30 units of graduate credit in course and seminar work properly distributed between major and minor fields.

A Master's degree *with thesis* requires a *minimum* of 30 units of graduate credit; not less than 24 units must be in course or seminar work properly distributed between major and minor fields. If after completion of the 30-unit requirement the candidate remains in residence, he must register for a minimum of 3 units per semester.

A Master's candidate who presents a thesis when not registered in residence will be charged 3 units of residence for the semester in which the thesis is presented.

CANDIDACY FOR THE MASTER'S DEGREE. To be considered as a candidate for a Master's degree (A.M., M.S., M.Ed., M.A.T., M.H.A.), the graduate student must (1) have made passing grades in all courses taken during the first period of residence (if he registers for fewer than 12 units of graduate courses during his first period of residence, he must make passing grades on the first 12 units of graduate courses), (2) have made a grade of *G* or *E* on at least 3

units of this work, and (3) have received the approval of the major department (or in the case of the M.A.T., of the supervisory committee).

TRANSFER OF GRADUATE CREDITS. Under certain circumstances a maximum credit of 6 units may be allowed for graduate courses completed elsewhere. The acceptance of credit up to this amount, however, will not reduce the minimum of required registration at Duke University.

With the approval of both the student's major department and the Dean of the Graduate School, a student who is granted such transfer credit may be permitted to register for as much as 12 units of thesis research instead of the usual 6 units. Or he may be permitted to fill out his schedule with as much as 6 units of further undergraduate training or 6 units of required language courses on the undergraduate level. In no case will credit be allowed for extension or correspondence courses.

TIME LIMITS FOR COMPLETION OF MASTER'S DEGREES. The candidate for the Master's degree who is in residence for consecutive academic years should complete all requirements for the degree *within two calendar years* from the date of his first registration in the Graduate School. *Any candidate* must complete all requirements *within six calendar years* of his first registration.

THE THESIS. The thesis should demonstrate the student's ability to collect, arrange, interpret, and report pertinent material on his special research problem. Although a publishable document is not required, the thesis must be written in an acceptable style and should exhibit the student's competence in scholarly procedures. Requirements of form are set forth in the Duke University *Manual of Style for Theses and Dissertations*, revised 1961, obtainable at the Duke University Book Store.

The Master of Arts

PREREQUISITES. As prerequisites to graduate study in his major subject, the student must have completed a *minimum* of 12 semester hours of approved college courses in that subject, and 12 additional semester hours in that subject or in related work. Since some departments require more than 12 semester hours, the student should read carefully the special requirements listed by his major department, which are included as headnotes to the course offerings in this bulletin.

LANGUAGE REQUIREMENTS. The candidate for the A.M. degree must have a reading knowledge of at least one modern foreign language. (The several departments reserve the right to specify which foreign languages are acceptable.) The language requirement must

be satisfied before the aster's examination is taken.

MAJOR AND MINOR SUBJECT. In his graduate work the student must present acceptable grades for a minimum of 24 units of graduate courses. Of these, at least 12 units must be in the major subject. The student must take a minimum of 6 units in a minor subject or related fields which are approved by his major department. The remaining 6 units of the required 24 may be taken in either the major or minor department, or in another approved by the major department and by the Dean of the Graduate School. In addition he must present a thesis, which carries a credit of 6 units for which he must register. Thus, his earned credit for the degree totals a *minimum* of 30 units.

FILING THE THESIS TITLE. At least one month before presenting the thesis, that is on or *before March 1 for a June degree* or on or *before July 1 for a September degree,* the student must file with the Dean of the Graduate School, on the official form, the title of the thesis and declaration of intention to graduate. The title must have the approval of the Director of Graduate Studies in the major department, and of the thesis supervisor.

PREPARING THE THESIS. All basic requirements for preparing the thesis are described in the *Manual of Style for Theses and Dissertations,* revised 1961, obtained at the Duke University Book Store, West Campus. The quality of paper, form, and binding are prescribed in the *Manual.*

SUBMITTING THE THESIS. Four typewritten copies of the thesis bound in snap binders supplied by the Library must be submitted in approved form to the Dean of the Graduate School on or before May 1 for a June degree or August 15 for a September degree and three to five days before the scheduled date of the student's examination. The copies will then be distributed to the several members of the examining committee. Two copies for the Library will be bound by the Ruzicka Bindery, fee $5.00 a volume. The student will state whether or not he wishes more than two so bound.

THE EXAMINING COMMITTEE AND THE EXAMINATION. The instructor who directs the thesis appoints an examining committee composed of the supervisor of the thesis and two other members of the Graduate Faculty, one of whom must be from a department other than that of the major. If the student has been permitted to take related work within the major department, the third member may represent the minor field within the department. This committee is submitted for approval to the Dean of the Graduate School when the thesis is first presented.

The candidate appears before this committee for an examination

which lasts for about one and one-half hours. The subject matter covered in the examination is usually restricted to the thesis and to the major field.

If the candidate passes his examination, the examining committee certifies this fact by signing the title page of all copies of the thesis. The candidate then returns the original, the first carbon copy of the thesis, and any others he wishes bound by Ruzicka, to the Dean of the Graduate School, who deposits them in the University Library.

The Master of Science

PREREQUISITES. The degree of Master of Science is offered in the fields of Civil, Electrical, and Mechanical Engineering. As prerequisites to this degree the student must have earned a Bachelor's degree from an accredited engineering college and have completed a minimum of 12 semester hours work in the major field.

FOREIGN LANGUAGE. There is no foreign language requirement for this degree.

MAJOR AND MINOR SUBJECTS. The work for the Master of Science degree is designed to provide a broad foundation in the fields of civil, electrical, and mechanical engineering. The student must present acceptable grades for a minimum of 24 units of graduate courses: at least 12 in course work in his major area of concentration in engineering (not necessarily confined to the offerings of the engineering department in which the student is registered); a minimum of 6 units in a minor subject outside of engineering which lends broad support to his program (usually in the mathematical or natural sciences); and the remaining 6 of the 24-unit course requirement in either the major or minor subject, or in an area approved by the major department and by the Dean of Engineering. In addition to the 24-unit course requirement, the student must present a thesis, which carries a credit of 6 units. Thus his earned credit for the degree totals a minimum of 30 units.

REGULATIONS AND PROCEDURES. The regulations and procedures for the thesis and the provisions for examination and an examining committee are the same as those for the Master of Arts degree.

The Master of Education

PREREQUISITES. Before a student is admitted to graduate study for this degree, he should have completed, on the undergraduate level, a minimum of 18 semester hours of approved work in Education.

Before the degree is conferred the student must have had one year

of actual teaching experience, or have met certification requirements by supervised student teaching in an accredited school. Such supervised student teaching may be at either the undergraduate or the graduate level.

REQUIREMENTS FOR THE DEGREE. The Master of Education degree may be earned either with or without the presentation of a thesis.

Without thesis: The required work includes a departmental major (Administration, Counseling, Elementary Education, Secondary Education, or Teaching the Emotionally Disturbed) of at least 12 units, and a minor of at least 6 units outside the Department of Education. The remaining 12 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

Toward the end of his residence the student must pass a comprehensive examination on his departmental major. This examination shall be prepared and conducted by the instructors of the student's major as designated by the Director of Graduate Studies of the Department of Education. Request to take this examination should be made to the Director of Graduate Studies at least two weeks before the date on which the examination is to be conducted.

With thesis: Students who elect this plan are permitted to substitute a thesis for 6 units for the required course work. The thesis subject must be approved by the instructor who is to direct it, and by the Director of Graduate Studies.

In addition to the thesis, the student must present at least 24 units of course credit. Of these, 12 units must be taken in the student's departmental major. Six units, constituting a minor, must be taken outside of the Department of Education. The remaining 6 units are elective within the area of Education and the minor field, but require the approval of the student's major advisor and the Director of Graduate Studies.

The regulations governing the thesis are the same as those for the Master of Arts degree.

The Master of Arts in Teaching

PREREQUISITES. The degree of Master of Arts in Teaching is designed for teachers already in service and for recent graduates of liberal arts colleges who wish to enter public school teaching.

A student should normally have completed a minimum of 12 semester hours in his proposed major subject and an additional 12 semester hours in that or related subjects. Should a student wish to undertake a graduate major different from his undergraduate major,

the prerequisites may be modified upon the recommendation of the student's committee and the approval of the Dean of the Graduate School.

PROGRAMS FOR THE DEGREE. Either of two programs may be arranged, in consultation with the student's committee:

A. A major in Education of 18 to 24 units and 6 to 12 units in non-education courses (for students seeking certification).

B. A major in non-education courses of 18 to 24 units and 6 to 12 units in Education (for students already certified).

In both programs a *minimum* of 30 units is required.

The non-education courses are to be taken in one or more subjects ordinarily taught in the secondary schools. The amount and distribution of this work will be determined by the needs of the individual student. A major in Biological Sciences or in Physical Sciences is possible in this program.

The Master of Arts in Teaching may be earned with or without the presentation of a thesis. If a student, in consultation with his committee, elects to present a thesis, 6 units of the total of 30 units required will be allotted to thesis research. He will then be required to complete 24 units of course credits. The regulations governing the thesis are the same as those for the A.M. (see p. 31). Candidates for the Master of Arts in Teaching who have not had teaching experience are required to take Education 215-216 in which case a minimum of 36 units is required.

THE COMMITTEE. Each candidate for the degree will be assigned a committee, appointed by the Director of Graduate Studies in the major department or area. This committee will consist of three members, at least one of whom will be from the Department of Education, and at least one from another department. The chairman of the committee will normally be chosen from the department of the major.

RECOMMENDATION FOR TEACHER CERTIFICATION. Elementary school teachers who already hold certificates and who desire the recommendation of Duke University for a graduate teaching certificate must include in their Master's program a minimum of 12 semester hours in subjects ordinarily taught in elementary school and 12 semester hours in courses in education designed to improve them as elementary school teachers.

Secondary school teachers who already hold certificates and desire the recommendation of Duke University for graduate teaching certificates must include in their Master's program a minimum of 18 semester hours in their teaching fields and 6 semester hours in courses in education designed to improve them as secondary school teachers.

The Master of Hospital Administration

PREREQUISITES. The Master of Hospital Administration degree is designed for persons intending to pursue a career of management in hospitals and other health agencies.

No specific undergraduate major is required for participation in graduate studies leading to this degree, but certain courses are prerequisites. Required are:

2 semesters of natural sciences
2 semesters of economics or political science, or 1 semester of each
2 semesters of psychology or sociology, or 1 semester of each
2 semesters of accounting, either basic or managerial

In selected cases, students who have not completed all prerequisites may be admitted on a conditional basis subject to completion of deficiencies while completing other requirements of the degree program.

PROGRAM FOR THE DEGREE. The program for this degree includes 36 graduate units, of which 18 are in courses in Hospital Administration and 18 are in designated courses in Economics, Political Science, and Sociology.

Completion of this program ordinarily requires 24 months. Included is a 12-month administrative residency which is conducted under faculty supervision in hospitals and other health agencies within commuting distance of the University campus. A portion of the residency is devoted to preparation and presentation of a written management study.

COMPREHENSIVE EXAMINATION. Successful completion of a comprehensive examination, consisting of both oral and written phases, is a prerequisite qualification for the M.H.A. degree.

The Doctor of Philosophy

The Ph.D. degree is essentially a research degree. Although course work is a necessary part of the student's program, the mere accumulation of course credits will not be sufficient for attaining this degree. The granting of the Ph.D. is based primarily upon the student's knowledge of a specialized field of study and upon the production of an acceptable dissertation embodying the results of original research.

REQUIREMENTS FOR THE PH.D. DEGREE. The formal requirements, discussed in detail below, for the Ph.D. degree are as follows: (1) foreign languages; (2) major and minor courses; (3) supervisory committee for program of study; (4) residence; (5) pre-

liminary examination; (6) dissertation; (7) final examination. In order to be considered for candidacy for the Ph.D. degree, the student must have passed all of his course work in the first year of graduate study; on at least 9 units of course work he must have made a grade of *G* or better.

FOREIGN LANGUAGES. Normally, a reading knowledge of both French and German is required.

A student working toward the doctoral degree should complete the language requirements for that degree by the end of his first year of residence. If he fails to meet these requirements by the end of his third semester of residence, he must register in the appropriate special reading course or courses until he has satisfied the requirements.

MAJOR OR MINOR. The student's program of study necessarily demands substantial concentration on courses in his major department. It must, however, include a minimum of six units in a minor subject or related fields approved by his major department. Use of related fields within the major department requires the approval of the Dean of the Graduate School.

COMMITTEE TO SUPERVISE THE PROGRAM OF STUDY. As early in a student's course of study as is practicable and *not later than two months before the preliminary examination* the Director of Graduate Studies in the major department will nominate for the approval of the Dean a supervising committee of five, one being designated as chairman. This committee will include at least three members of the major department and one from the minor if a minor is involved. This committee will draw up a program of study and administer the preliminary examination and, with such necessary changes as are approved, the final doctoral examination. However, should all members of the committee be from the major department, at least one member of another department will be added or substituted for the final doctoral examination. The final examination may be administered with a minimum of four members.

When the preliminary examination is arranged, the committee and the Director will submit to the Dean the student's program of study bearing a statement that the Department's course and language requirements have been or are being completed.

RESIDENCE. For students who first registered in September 1959 or thereafter the *minimum* registration requirement is 60 units of graduate credit not more than 30 units of which may be accepted by transfer. Since a full program is 30 units per academic year, the prospective Ph.D. candidate who enters with the A.B. or B.S. degree

must plan to spend in residence a *minimum* of two academic years; if he enters with the A.M., his *minimum* residence is one academic year. (For the definition of *residence*, see page 24.) If there are undergraduate deficiencies in his program, he may in addition to the minimum requirements be required to take preliminary undergraduate courses for which he will not receive graduate credit. Even if there are no such undergraduate deficiencies, the student's supervisory committee will determine what requirements if any above the minimum the student must meet.

TIME LIMITATIONS. 1) At the time that the preliminary examination is passed any courses, language certifications, or other credits for advanced standing which are more than six calendar years old will not be accepted toward fulfilling the minimum requirements of the doctoral degree.

2) The student should normally pass the preliminary examination by the end of his second year of graduate study. If he has not passed it by the middle of the third year, he must file with the Dean of the Graduate School a statement explaining the delay and setting a date for the examination. Except under unusual circumstances, extension will not be granted beyond the end of the third year.

3) The doctoral dissertation should be submitted and accepted within two calendar years after the preliminary examination is passed. Should the dissertation not be submitted and accepted within four years after the examination, the candidate, with the approval of his committee, may petition the Dean of the Graduate School for an extension of one year. Should this extension be granted and the dissertation not be submitted and accepted within the year, the student to remain a candidate for the degree must pass a second preliminary examination. In such a case, the time limit for submitting the dissertation will be determined by the Dean of the Graduate School and the candidate's committee.

CREDIT FOR SUMMER WORK. Credit earned in the Summer Session will not reduce the minimum required residence.

PRELIMINARY EXAMINATION. A student is not accepted as a candidate for the Ph.D. degree until he has passed the preliminary examination. A transfer student who may have passed a preliminary examination elsewhere must nevertheless take the examination in this Graduate School. The examination ordinarily covers both the major and minor fields.

Except in unusual circumstances approved by the Dean, a preliminary examination will not be scheduled between the last day of

the spring semester examination period and registration day in the fall semester.

PRIVILEGE OF RE-EXAMINATION. Should the student fail the preliminary examination, he may apply, with the consent of his supervisory committee and of the Dean of the Graduate School, for the privilege of a second examination to be taken no sooner than three months after the date of the first. Failure on the second examination will render the student ineligible to continue his program for the Ph.D. degree at Duke University.

THE DISSERTATION. The dissertation is expected to be a mature and competent piece of writing, embodying the results of significant and original research.

FILING TITLE. Not later than March 1 (March 2 if March 1 falls on Sunday) preceding the June commencement at which the degree is expected to be conferred, the student must file with the Dean of the Graduate School, on the official form to be obtained from the Graduate Office, the title of the dissertation. This title must receive the written approval of both the Director of Graduate Studies of the student's major department and the professor who directs the dissertation.

FORM. The basic requirements for preparing the dissertation such as quality of paper, form, and binding are prescribed in the instructions for microfilming (see below) and in the *Manual of Style for Theses and Dissertations*, revised 1961, to be obtained from the Duke University Book Store, West Campus.

SUBMITTING DISSERTATION. The dissertation must be completed to the satisfaction of the instructor who directs it. Four typewritten copies bound in snap binders obtained in the Library must be deposited with the Dean of the Graduate School on or before *April 15* preceding the June commencement when the degree is to be conferred. The dissertation must be submitted to the Graduate Office from seven to ten days before the scheduled date of the student's examination.

PUBLICATION ON MICROFILM. All doctoral dissertations will normally be published on microfilm through University Microfilms, Ann Arbor, Michigan. Authors may, if they wish, also copyright them. The abstract will be published in *Dissertation Abstracts. Before final typing is completed, the candidate should obtain in the Graduate Office detailed instructions on the procedure* together with a microfilming agreement which is signed and returned when the dissertation is finally deposited in the Graduate Office.

In brief, all copies of the dissertation, the original in clean type, will remain unbound except for spring binders. Ten copies of an *abstract*, carefully written and not more than 600 words long, are submitted

when the dissertation is first presented to the Graduate Office. A nonreturnable dissertation fee of $25 is charged for handling and microfilming. If copyright is desired, an additional fee is charged of $6 plus 2½ cents per page. The original copy and first carbon copy will be bound by the Ruzicka Bindery. The fee is $5.00 a volume. The student may request that more than the two copies be so bound.

FINAL EXAMINATION. The final oral examination shall be primarily on the dissertation. Questions may, however, be asked in the candidate's major field. Except in unusual circumstances approved by the Dean a final examination will not be scheduled between the last day of the spring examination period and registration day in the fall semester.

If a student fails his final examination, he may be allowed to take it for a second time, but not sooner than six months from the date of his first. Permission to take the second examination must be obtained from the instructor who directed the dissertation and from the Dean of the Graduate School. Failure to pass the second examination renders the student ineligible to continue work for the Ph.D. degree at Duke University.

The Doctor of Education

The Doctor of Education degree is a professional degree planned for those who are, or intend to become, school administrators, supervisors, directors of instruction, curriculum consultants, or college teachers of education.

ADMISSION. The candidate for the Ed.D. degree must meet the same requirements for admission to the Graduate School as the candidate for the Ph.D. degree. In addition to these uniform requirements, the candidate for the Ed.D. (1) must have had at least two years' experience in educational work; (2) must present strong letters of appraisal and recommendation from persons well qualified to speak with authority of his abilities; and (3) must present himself, if possible, for a personal interview. The Standing Committee on the Ed.D. degree reserves the right to insist upon an interview.

Persons who are primarily concerned with meeting requirements set by North Carolina for the advanced certificate for principals and supervisors must request and secure admission for doctoral study.

RESIDENCE, ETC. Regulations concerning residence requirements, grades required during the first year of graduate study, and the preliminary examination are the same as those for the Ph.D.

FOREIGN LANGUAGES. There are no foreign language requirements for the Ed.D. degree.

PROGRAM OF WORK. The candidate for the Ed.D. degree will choose as his major field either Educational Administration and Supervision or Curriculum and Instruction.

Candidates in Administration and Supervision will take approximately 24 units in that field, including the seminar in School Administration. In addition, they will take approximately 18 units in other professional courses, and a minor of approximately 18 units approved by the candidate's supervisory committee and the Standing Committee on the Ed.D. degree.

Candidates in Curriculum and Instruction will take approximately 24 units in Curriculum and Instruction. In addition, they will take approximately 12 units in other professional courses, and a minor of approximately 24 units in the humanities, the natural sciences, or the social sciences, exclusive of professional education.

The program of work for each candidate must be approved by the Standing Committee for the Ed.D. degree.

DISSERTATION. The candidate must write a dissertation, for which the formalities of presentation, including its defense in a final examination, are the same as those for the Ph.D. degree. The type of dissertation will depend upon which of the following plans the candidate adopts:

Plan A. A candidate choosing Plan A will write a dissertation which is expected to be a mature and competent piece of writing, embodying the results of significant and original research. It must be, in essence, a contribution to knowledge.

Plan B. A candidate choosing Plan B will serve at least a year in an administrative post, or a teaching position in an elementary or secondary school, subsequent to the completion of all course requirements and a year of residence. His dissertation may be concerned with a problem, or several closely related problems, growing out of this experience. Although the dissertation written under Plan B is of a practical nature, it must demonstrate the candidate's ability to investigate and report on a significant phase of education in his major field.

PUBLICATION ON MICROFILM. The dissertation will be published on microfilm, as is the dissertation for the Ph.D.

FINAL EXAMINATION. Regulations for the final examination are identical with those of the Ph.D. degree.

Awards and Fees

Fellowships, Scholarships, and Assistantships

FOR the encouragement and financial assistance of graduate students of marked ability, Duke University has established a considerable number of fellowships, scholarships, and assistantships. The stipends for these range from $600 to $3,400. Holders of grants pay tuition and other fees regularly required of all graduate students.

Fellows and scholars pay full tuition and fees and are expected to register for a full schedule of course work each semester. In general, assistants register for a four-fifths program and pay 12 units tuition and fees per semester.

APPLICATION FOR AWARDS. Application for these awards, along with all supporting documents, must be submitted on or before February 15. Notification of awards is made about April 1. Late applications will be considered, should any vacancies occur in the list of appointees. No appointment is made for longer than one academic year.

Further information and application forms may be obtained from the Dean of the Graduate School, Duke University.

Awards offered for 1965-66 are:

FELLOWSHIPS: Approximately thirty James B. Duke Fellowships with stipends of $3,400; one Angier Duke Memorial Fellowship of $3,400; one Otis Green Foundation Fellowship in Humanities or Social Sciences of $2,500; four Gurney Harriss Kearns Fellowships in Religion ranging up to $2,800; University Fellowships ranging from $2,000 to $3,000.

UNIVERSITY SCHOLARSHIPS. The University offers a number of scholarships with stipends ranging from $600 to $1,800.

GRADUATE ASSISTANTSHIPS. Appointments as Departmental Assistants and readers carry a total stipend in the range of $1,000 to $3,200. The value of stipend is determined by the fraction of time given to assisting, the qualifications of the assistant, and the nature of work assigned.

RESEARCH ASSISTANTSHIPS. Appointments are for pre-doctoral candidates whose special training and qualifications enable them to serve as assistants to individual staff members in certain depart-

ments. Stipends range from $600 to $3,000 based on the assisting time required.

Appointments to qualified, advanced students as Research Associates, Research Fellows, and Research Scholars. Stipends range upward from about $1,800.

COKESBURY GRADUATE AWARDS IN COLLEGE TEACHING. These awards, sponsored by the Board of Education of the Methodist Church, are designed to assist graduate students who are committed to a Christian philosophy of higher education and who intend to teach in college. The applicant must have been a member of the Methodist Church for at least three years, and must have been accepted for or be currently pursuing a program of graduate studies at one of the Methodist-related universities, including Duke University, approved for this program. Awards, for one year, vary in amount from $600 to $2,500.

Application must be completed before February 15. For further information and application forms, apply to the Dean of the Graduate School.

CHARLES W. HARGITT RESEARCH FELLOWSHIP IN ZOOLOGY. The Charles W. Hargitt Research Fellowship in Zoology is devoted to the promotion of research in the field of cellular studies. It may be awarded to post-doctoral candidates or established investigators who desire to engage in research and to outstanding predoctoral candidates in support of their graduate training. The recipient will be expected to engage in full-time research or training and will have no departmental duties. Research facilities will be provided. Appointment is for one year with the possibility of reappointment.

Inquiries and applications should be addressed to the Chairman, Hargitt Fellowship Committee, Department of Zoology.

SHELL FELLOWSHIPS

IN ELECTRICAL ENGINEERING. This fellowship is established to encourage graduate studies leading to an M.S. or Ph.D. degree in electrical engineering. Preferential consideration is given to candidates in an advanced stage of their work toward the doctorate. This award provides for a single student or a childless married student a stipend of $2,000 per academic year, or $2,500 per 12 consecutive months of study; or for a married student with one or more children, a stipend of $2,600 per academic year, or $3,200 per 12 consecutive months of study. In addition, the Fellowship provides actual tuition and fees required of the recipient and a special allotment of $1,000 to the major department to be applied toward equipment and materials needed by the Fellow in his research. Appointment is for one year with the possibility of reappointment.

Inquiries and applications should be addressed to the Associate Dean for Graduate Study and Research, College of Engineering.

IN AFRICAN STUDIES. Two fellowships are available to qualified students in social sciences who are preparing for careers in the State Department, including the foreign services of the United States, the United Nations, or other international agencies, or in research and teaching in international affairs in academic institutions within the United States. They must be citizens of the United States or presently residing permanently in the United States and intending to become citizens. The fellowships are intended to cover the expenses of field research in the preparation of doctoral dissertations. The stipend for each fellowship is $4,000 plus a reasonable amount for transportation expenses. Inquiries should be made to the Executive Secretary, Commonwealth-Studies Center, Duke University.

EXCHANGE FELLOWSHIPS WITH THE FREE UNIVERSITY OF BERLIN. Duke University has an exchange arrangement with the Free University of Berlin which will provide fellowships for two graduate students to work during the regular academic year in Berlin. Departments will submit nominations to the Dean of the Graduate School before February 15.

PEACE CORPS FELLOWSHIPS. Three Peace Corps Fellowships may be offered to first-year applicants who have completed duty with the Peace Corps. Request for consideration for this award should be noted on the application for admission, which must be filed before February 15. Recommendation will be made by the major department. The stipend will be $3,000.

FELLOWSHIPS AND GRADUATE SCHOLARSHIPS IN FORESTRY. Information regarding special fellowships and graduate scholarships in forestry may be obtained from the Dean of the School of Forestry, Duke University, Durham, North Carolina.

FEDERAL FELLOWSHIP PROGRAMS. In 1964-65 Duke University was approved to offer programs sustained by National Defense Act Graduate Fellowships in Economics, History, Philosophy, Physics, Romance Languages, and Sociology, and Foreign Language Fellowships. The University is approved to recommend approximately twenty applicants for Cooperative Graduate Fellowships and Summer Fellowships for Graduate Teaching Assistants offered by the National Science Foundation, to offer NASA Predoctoral Traineeships in the space sciences, and NSF Graduate Traineeships.

PART-TIME INSTRUCTORS. A number of departments offering graduate work make use of exceptionally qualified graduate students as part-time instructors. These students are usually able to register for a graduate program of 9 units a semester. Inquiries con-

cerning such appointments should be directed to the Chairman of the Department concerned.

PAYMENTS TO HOLDERS OF AWARDS. Payments of stipends to all graduate students holding fellowships, scholarships, and graduate assistantships for the academic year are made by the Bursar of the University in eight monthly installments payable on the 21st of each month beginning October 21st. Arrangements may be made to prorate tuition charges on the same basis.

LOANS. The University has been allotted a sum for use under the provisions of the National Defense Act Loan fund. In addition, University funds are available to grant low-interest loans to deserving students of good academic standing. Application should be made to Mr. W. O. Petty, Jr., 102B Allen Building, Duke University.

Financial Regulations

The Graduate School awards such financial aid as fellowships, scholarships, and assistantships. The several departments engage part-time instructors who may be graduate students. The Treasurer of the University, however, has sole responsibility for paying stipends to students, collecting from them such fees as are due, and making special arrangements for prorating fees.

GENERAL FEES IN THE ACADEMIC YEAR. The following table shows the general fees and charges collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration for that semester. No student is admitted to classes until arrangements have been made with the Bursar of the University for the settlement of fees.

Tuition and general fees* ($40.00 per unit)	$600.00
Athletic Fee, not including federal tax, optional, per year, payable in the fall semester	15.00
Room rent	
Fee for Microfilming, payable by candidates for a doctoral degree when the dissertation is presented to the Graduate Office after the final examination	25.00
Fee for taking an ETS Foreign Language test, payable to the University Counseling Center	8.00

* General fees, in lieu of most special charges, include the following fees: Matriculation, Medical, Library, Damage, Commencement, Diploma, and an average of the Laboratory and Material Fees.

Tuition and fees for a full semester program of 15 units amount to $600.00. For a part program, tuition and fees are computed at the rate of $40.00 per unit.

SPECIAL FEES FOR TEACHERS AND OTHERS. The Graduate School recognizes a special obligation to encourage the following types of students in their professional and personal advancement:

(1) members of the faculties of the neighboring public schools and colleges, currently engaged in *full-time* teaching while taking courses in the Graduate School, (2) ministers of neighboring churches, (3) wives of Duke faculty members, (4) *full-time* employees of Duke University who are paid on a monthly basis throughout the year. The reduced fees do not apply to teachers and ministers while on leave of absence, nor to holders of fellowships, scholarships, or graduate and research assistantships, nor to part-time instructors.

Persons eligible for the reduced fee must meet the admission standards required of all graduate students and must be admitted to the Graduate School. They may enroll for one or two courses per semester (in no case totaling more than 7 units) upon payment of a fee of $5.00 for registration for each semester and a tuition fee of $15.00 per unit of credit or an audit fee of $15.00 per course. The *in absentia* fee will not be charged at this rate.

AUDIT FEE. In a semester in which a student registers and pays fees for 12 units or more, he may audit one course without charge. Should he be permitted to audit a second course or should he be registered for less than 12 units, the audit fee is $15.00 per course.

FEE ADJUSTMENT WITH CHANGE OF REGISTRATION. Arrangements made with the Bursar to prorate tuition and fee charges do not imply that the full amount is not due and payable on the date of fall and spring registration. During the fourteen-day period for change of registration tuition and fees will be adjusted to necessary and approved changes. After the fourteen-day period no change of tuition and fees is possible.

STIPENDS AND INCOME TAX. Ordinarily stipends awarded under fellowships and scholarships are not subject to income and Social Security tax. However, a portion of the award to graduate assistants and research assistants may be subject to both. The Graduate Office will supply detailed information.

Living Accommodations

The Men's Graduate Center is available to men enrolled in the graduate and professional schools. The rooms are equipped for two persons and the rental charge for a double room is $125 per semester for each occupant.

Epworth Hall on the Woman's College Campus is available to women enrolled in the graduate and professional schools. The rental charge for a single room is $162.50 each semester. The rental charge for a double room is $137.50 per semester for each occupant.

Duke University Apartments are available for married graduate

and professional students. The 224 units are complete with basic furnishings. Rental rates per month currently are $70 for an efficiency apartment, $80 for a one-bedroom apartment, and $90 for a two-bedroom apartment. For further information on married student apartments, write to the Director of Housing, Duke University, Duke Station, Durham, North Carolina.

Rooms and apartments may be reserved for new applicants only if they have been accepted officially by the Graduate School of Arts and Sciences, and after the required $25 room or security deposit has been made with the Office of the Duke University Bursar. The initial room or security deposit is effective for reservations and is held until the room or apartment is vacated. Applications for rooms and apartments are to be made to the Director of Housing, Duke Station, Durham, North Carolina. Rooms are rented for the academic year, but for no period of less than one semester. Apartments are rented on a lease basis for specific periods, usually an academic year or longer.

No refund of residence hall room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

Regulations governing the occupancy of rooms and apartments will be supplied directly from the Director of Housing when the reservations are made. Occupants are expected to abide by these regulations.

DINING SERVICE. Food service on both the Woman's College Campus and the West Campus is cafeteria style. The cost of meals approximates $2.00 to $2.50 per day, depending upon the need and taste of the individual. The dining facilities on the West Campus include three cafeterias with multiple-choice menus, a grill, and, in addition, the Oak Room where full meals and a la carte items are served. The Men's Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 P.M. The prices are the same as in the West Campus Union. Because of the large number of those served in the dining halls, it is not possible to arrange special diets for individual students.

MEDICAL CARE. The complete medical facilities of the Duke University Medical Center are available to all members of the University community. To secure the benefits of the Student Health program, a graduate student during the term or semester in which the illness occurs must 1) in the Summer Session term be registered for at least 1 unit research or 3 units of course work, 2) prior to completing minimum residence requirements be registered for at least 9 units per semester and thereafter according to the schedule on pp. 25 and 26. Students are not covered during vacations and their dependents and members of their family are not covered at any time. Care is

provided for men at the Student Health Office in Duke Hospital and for women at the Woman's College Infirmary.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions, and elective surgery.

Graduate students are urged to carry adequate health insurance to supplement Student Health Program services. If students have insurance providing hospitalization, surgical, or medical benefits, the benefit shall be applied to the cost of their medical care.

Students whose course-load entitles them to full coverage under the Student Health program are eligible for a complementary insurance policy which then comprises protection for the entire calendar year. Concerning this complementary policy inquire of the Dean of the Graduate School. *Foreign students are required to hold this or another acceptable policy.*

MOTOR VEHICLES. Each student possessing or maintaining a motor vehicle at Duke University shall register it annually at the beginning of the fall semester. If a student acquires a motor vehicle and maintains it at Duke University after enrollment, he must immediately register it. At the time of registration of a motor vehicle the following documents must be presented:

(a) State vehicle registration certificate.

(b) Valid driver's license.

(c) Satisfactory evidence of automobile liability insurance coverage with limits of at least $5,000 per person and $10,000 per accident for personal injuries, and $5,000 for property damage, as required by the North Carolina Motor Vehicle Law.

(d) If the student is under 21, a statement signed by the student's parent or guardian granting the student permission to operate a motor vehicle at Duke University.

STUDENT ACTIVITIES. Graduate students new to Duke University may be reminded that they are welcomed to use such recreation facilities as swimming pools, tennis courts, golf course, and to affiliate wth choral, drama, and religious groups. They may become junior members of the American Association of University Professors and may affiliate with Phi Beta Kappa and social fraternities.

THE DUKE UNIVERSITY COUNSELING CENTER. Through the counseling center, the University provides a professional counseling service designed to aid students in gaining a better understanding of

themselves and the opportunities available to them. Counseling is available in the areas of career planning, educational opportunities, and personal and social adjustment.

The Center maintains files of educational and vocational information related to career planning, graduate educational programs and fellowships, and study aids.

National and University-wide testing programs are administered by the Center. A continuing program of research in the areas of counseling and testing is also carried on by the staff of the Center.

APPOINTMENTS OFFICE. Duke University maintains an active Appointments Office which has steadily been placing students in teaching and industrial positions. The services of this office are available without charge to graduate students. Those who are interested in securing employment through the Appointments Office, or those who wish to have available for their own use in securing employment a complete file containing their academic record and pertinent recommendations, should register in this office.

ESTIMATED EXPENSES IN THE ACADEMIC YEAR. The necessary expenses of a graduate student are moderate. The University dormitories and Unions provide comfortable and wholesome living conditions at a minimum cost. Incidental expenses for recreation, traveling, clothes, and other items naturally depend on the tastes and habits of the individual. The table below lists the necessary *college* expenses for one academic year for a full program of work:

	Low	*Moderate*	*Liberal*
Tuition and fees	$1200.00	$1200.00	$1200.00
Room Rent	225.00	250.00	275.00
Board	475.00	525.00	550.00
Laundry	30.00	40.00	50.00
Books	30.00	40.00	50.00
	$1960.00	$2055.00	$2125.00

Facilities for Graduate Study

The Libraries

THE University Libraries contain 1,650,000 volumes. In addition to the collections in the General Library, there are eight school and departmental libraries: Divinity, 112,845 volumes; Engineering, 33,202 volumes; Law, 134,424 volumes; Medical, 67,088 volumes; Woman's College, 144,377 volumes; Biology-Forestry, 81,258 volumes; Chemistry, 20,984 volumes; Mathematics-Physics, 27,740 volumes. In 1963-64, 71,018 volumes were added; 7,300 periodicals and 130 newspapers are received currently.

The General Library building, which was doubled in size in 1949, incorporates many modern arrangements for the preservation of the collections and for the convenience of the research scholar. Construction on an extension of the general library facilities, designed to provide twice the existing space, will begin early in 1965. Book stacks, storage areas, and quarters for rare books and manuscripts are air-conditioned. In the stacks, 274 carrels are available to graduate students as places of study, and a large reading room on the first floor of the building is reserved for graduate students. Upon application, graduate students may receive permit cards entitling them to use of the stacks.

A division of photographic services, with the most modern cameras and other equipment for microfilming or other photographic reproduction of printed and manuscript materials, provides a battery of reading machines to serve the Library's large collection of microfilms of rare books, periodicals, and newspapers.

The extensive resources of the Library for research students may be suggested by the following special collections:

THE TRENT COLLECTION OF WALT WHITMAN, containing the first and all other important early editions or issues of *Leaves of Grass*; books and articles of Whitman biography and criticism; nearly 300 manuscripts and 400 letters; and pictures, sheet music, and other miscellanea.

THE GEORGE WASHINGTON FLOWERS COLLECTION of books, manuscripts, pamphlets, and newspapers on all phases of Southern history.

THE ARENTS COLLECTION of several hundred volumes relating to the culture and production of tobacco and the manufacture and distribution of tobacco products.

THE JAMES A. THOMAS COLLECTION of books on Chinese history and culture.

THE GUIDO MAZZONI LIBRARY, a collection of approximately 23,000 volumes and 67,000 pamphlets covering the whole range of Italian literature, with special strength in the nineteenth century.

THE GUSTAVE LANSON LIBRARY of 12,000 books and monographs on French literature.

LATIN-AMERICAN COLLECTIONS, built around a special Peruvian library of 7,000 books and manuscripts, a Brazilian library of several thousand volumes, and an Ecuadorian library of 2,000 volumes, supplemented by strong collections of the public documents of these and other Latin-American countries.

THE ROBERTSON LIBRARY of Philippiniana.

THE FRANK C. BROWN FOLKLORE COLLECTION, consisting of about 38,000 manuscript pieces, 1,400 vocal recordings, and 650 musical scores of North Carolina folklore.

THE STRISOWER LIBRARY of International Law, numbering about 5,000 volumes, with many rare books and periodical files.

THE TRENT COLLECTION IN THE HISTORY OF MEDICINE (Medical Center Library), containing about 3,000 books and 2,500 manuscripts with special strength in anesthesia, anatomy, English medicine, vaccination, yellow fever, pharmacy, and medical biography.

THE HOLL CHURCH HISTORY LIBRARY, dealing primarily with the period of the Reformation.

THE FRANK BAKER COLLECTION OF WESLEYANA AND BRITISH METHODISM, consisting of 1,500 editions of the works of John and Charles Wesley, 8,000 volumes concerning all phases of the development of British Methodism, 4,000 volumes relating to the religious and social background of British Methodism, and 4,000 manuscript pieces by the Wesleys and their coadjutors and by British Methodists of the last 200 years.

COLLECTIONS IN ENGLISH AND AMERICAN LITERATURE, where emphasis has been placed principally on the eighteenth and nineteenth centuries, with the collections of Swinburne, Tennyson, Rossetti, and Bryant, significant groups of annotated copies and first editions of Coleridge and Byron, the Carroll Wilson collection of Emerson, some 5,000 items of eighteenth-century English poetry and prose, and the Paul Hamilton Hayne library of American literature.

In addition to these and other special collections, the Libraries contain excellent files of United States federal and state documents, public documents of many European and Latin-American countries, and publications of European academies and learned societies. The

newspaper collection, with 13,250 volumes and 12,550 reels of microfilms, has several long eighteenth-century files, strong holdings of nineteenth-century New England papers, and of ante-Bellum and Civil War papers from North Carolina, South Carolina, and Virginia; there are also many European and Latin-American papers. The manuscript collection of 3,817,064 items is particularly strong in all phases of the history, politics, and social and economic life of the South Atlantic region, though it includes also significant papers in English and American literature, and several notable medieval manuscripts in both Greek and Latin.

Science Laboratories

BOTANICAL AND ZOOLOGICAL LABORATORIES. Facilities for graduate study in the Departments of Botany and Zoology are located on the West Campus. A new Biological Sciences building, completed in 1962, contains well-equipped modern laboratories for teaching and research in the various fields of botany, forestry, and zoology. Special facilities are available, such as animal rooms, greenhouses, darkrooms, refrigerated and controlled environment laboratories, electron microscope, Van de Graaff accelerator, X-ray machine and other radiation and radioisotope equipment, and other modern research facilities. A large "phytotron" is under construction.

The Botany Herbarium, containing over 310,000 specimens, is world-wide in scope and includes notable collections of mosses and lichens. The Biology-Forestry Library contains an outstanding collection of books and periodicals. The Library currently subscribes to over 800 journals and has 85,000 volumes. Unique assets for teaching and research are the Sarah P. Duke Gardens, conveniently located on the West Campus; the Duke Forest, comprising 7,000 acres of woodland adjacent to the West Campus; the Field Station for the Study of Animal Behavior; and the Duke University Marine Laboratory at Beaufort, North Carolina.

Scholarships for advanced study during the summer months are maintained at the Highlands Laboratory, Highlands, North Carolina, at the Marine Biological Laboratory, Woods Hole, Massachusetts, and at the Duke University Marine Laboratory. Requests for information concerning scholarships at the Highlands Laboratory should be addressed to the Botany Department, those at Woods Hole to the Zoology Department, and those at Beaufort to the Duke University Marine Laboratory.

MARINE LABORATORY. The Duke University Marine Laboratory is located at Beaufort, North Carolina, one and one-half miles from the open ocean. The physical plant includes five well-equipped research buildings, class rooms, and dormitories. The Lab-

oratory provides excellent facilities for graduate courses in botany and zoology and for thesis research throughout the year. Special research and training facilities for field work in marine biology and biological oceanography include two motor vessels and a new 118-foot biological research vessel *Eastward*, with a broad array of excellent apparatus for collecting and environmental measurements.

Six National Science Foundation Predoctoral Traineeships in biological oceanography and two Bureau of Commercial Fisheries Educational Grants in marine biology are available to advanced graduate students during the academic year. In the summer of 1965 twelve National Science Foundation Predoctoral Awards will be offered for course or research work in marine biology at the Marine Laboratory. For information concerning awards, courses, and research space, write to the Director, Dr. C. G. Bookhout, Duke University Marine Laboratory, Beaufort, North Carolina.

ANIMAL BEHAVIOR STATION. Located less than one mile from the campus, the 75 wooded acres of the Station provide facilities for studies of penned and free-ranging, and caged animals. These facilities include sound-proof observation chambers, barns, aviaries, and pens for large mammals and birds, and two water-fowl ponds. A permanent facility for pro-simian primates (both simulated "natural habitats" and cages) are under construction. For information regarding research space or research assistantships in Behavior, write to Dr. P. H. Klopfer, Dept. of Zoology, or Dr. D. K. Adams, Dept. of Psychology.

PHYSICAL LABORATORIES. The Physics Building, comprising about 130,000 square feet of floor space, is devoted to the research and instruction of the Departments of Physics and Mathematics.

In addition to the lecture halls and the elementary laboratories, the building includes special laboratories for work in electronics, microwaves, optical spectroscopy, atomic, nuclear, high energy, and low-temperature physics. Special research equipment includes a 21-foot concave grating and other instruments for visible, ultraviolet, and Raman spectra; facilities for research in microwave spectroscopy and other high-frequency phenomena; two Van de Graaff accelerators, one 4 MEV and one high intensity 3 MEV, and associated equipment for nuclear physics research; a helium liquifier, other low temperature equipment, and three large electromagnets for nuclear resonance research below 1° Kelvin; A DDP-24 control computer which is used on-line with two conventional projection microscopes to measure bubble chamber tracks of high energy particles.

The Physics Building contains the Mathematics-Physics library, an IBM 7072 computer, and a shop staffed by ten instrument makers, six electronics technicians, and a glass blower.

CHEMISTRY LABORATORIES. The Chemistry Building has a floor area of approximately 57,000 square feet, of which more than half is devoted to advanced teaching and research. Modern instruments are available for routine measurements, as well as for research involving ultraviolet, visible, and infrared spectroscopy. Also provided are two nuclear magnetic spectrometers, one for routine analytical purposes, and the other, a high resolution instrument, for research. In addition to extensive equipment for X-ray crystallography, facilities are available for electron spin resonance measurements, polarography, light scattering, and mass spectrometry.

Well-equipped shops, with a mechanic and an electronics technician, provide facilities for the construction of special apparatus and for repair and maintenance of instruments.

The Chemistry Library, conveniently located in the building, has on its shelves over 20,400 volumes, and currently subscribes to over 200 scientific periodicals.

PSYCHOLOGY LABORATORIES. The Psychology Department occupies new and fully renovated quarters, comprising about 53,000 square feet of floor space, which house its main laboratories, seminar rooms, classrooms, and special facilities. The building is completely air-conditioned for year-round research and study. For the use of graduate students and staff, the Department houses a periodical reference room with an extensive collection of current and bound journals and monographs in psychology and related subjects. In addition to general purpose laboratories, there are special facilities for animal behavior studies; sound-proofed and electrically-shielded rooms for use with human and animal subjects; specially equipped rooms for the study of visual perception; electrophysiological recording rooms; a histological laboratory and surgery; photographic dark rooms, etc. The social psychology unit (joint with the Department of Sociology) contains observation, communication, and recording facilities for the study of social interaction. There is an extensive suite of interview and observation rooms for the study of human personality and clinical processes. An on-line digital computer is located in the animal behavior laboratories, and automatic computation equipment is available for all research purposes. A departmental shop, with competent technicians in charge, is maintained to provide specialized mechanical and electronic apparatus. Other facilities for research and teaching are available in the laboratories and clinics of the adjacent Duke Medical Center.

A number of clinical installations for adults and children, devoted to an extensive range of clinical and guidance problems, cooperate with the department in providing facilities for research and training. In addition, the Department operates a Preschool Laboratory for four-

and five-year old children. The Department cooperates with the Department of Zoology in the operation of a 75-acre field station in the near-by Duke Forest for the study of animal behavior in natural settings. (See p. 53, Animal Behavior Section.)

COMPUTING LABORATORY. Since 1958 an IBM electronic computer has been available in the Computing Laboratory for instruction in modern computing methods and for research. The Computing Laboratory is under the guidance of the Department of Mathematics and is located in the Physics Building. It is being used for research in the physical sciences, engineering, mathematics, and in the biomedical and social sciences. The Laboratory is currently equipped with an IBM 1401-7072 system. This system offers many of the most recent advances in computing equipment. Suitable auxiliary machines for processing punched cards are also provided.

Engineering Laboratories

The instructional and research laboratories, together with the library, classrooms, shops, and offices, are located in the Engineering Building on the West Campus. Engineering laboratories of particular interest to graduate students are these:

Civil Engineering: experimental stress analysis; hydrodynamics; materials science; sanitary engineering; soil mechanics; and structural mechanics.

Electrical Engineering: solid-state materials; ferromagnetics; superconducting circuits; electronics; analog computer; automatic control; energy conversion; spacecraft electrical systems; and spacecraft telemetry systems.

Mechanical Engineering: heat transfer, fluid mechanics, environmental thermodynamics; response of physical systems; and vibration studies.

These facilities are described in the *Engineering Bulletin*.

Duke Forest

The Duke Forest consists of approximately 7,000 acres of land, most of which is adjacent and easily accessible to the University campus. Situated in the lower Piedmont region and composed of second-growth shortleaf pine, loblolly pine, and hardwoods, the Forest is representative of the various types of timber growth and soils found throughout the region. Through placing the Forest under intensive management for forestry purposes, substantial progress has been made in developing the educational work and research in forestry.

The proximity of the Forest to the laboratories, greenhouses, and library facilities of the University provides an excellent opportunity for advanced study and research in forestry. Research, particularly in the fields of silvics, forest soils, silviculture, forest management, properties of wood, forest-tree physiology, forest entomology, and forest pathology, is well under way. Several members of the botany and zoology staffs are also engaged in research in the Duke Forest.

Forest Sciences Laboratory

The establishment of the Forestry Sciences Laboratory research facility of the Southeastern Forest Experiment Station in the Research Triangle Park near Durham provides an unusual opportunity for complementing the research programs of students in the Department of Forestry. Specialized research projects in forest entomology, pathology, physiology and soils are currently under way at the Laboratory. The staff of the Laboratory is available for consultation, participation in seminars and may offer advice to students conducting research in the Department of Forestry. Arrangements may also be made for students to conduct certain aspects of their research at the Laboratory.

Commonwealth-Studies Center

The Commonwealth-Studies Center was established at Duke University in 1955 and has received financial support from the Carnegie Corporation of New York, the Rockefeller Foundation, and the Ford Foundation. Its objectives are:

1. to encourage and stimulate by financial assistance and other means the research interests of individual scholars in Commonwealth fields,
2. to establish at Duke University a Center whose facilities will promote interest in research relating to the Commonwealth, provide the materials for basic research, and encourage research by Commonwealth and American students and faculty.

The Center awards fellowships to graduate students from Australia, Canada, and New Zealand who propose to study for the Ph.D. degree in economics, history, or political science at Duke University. National selection committees in each of the mentioned countries facilitate the selection of fellows.

Each spring the Center sponsors a joint seminar for graduate students in economics, history, and political science. In addition the Center sponsors occasional lectures at the University by distinguished Commonwealth scholars.

Financial assistance is provided to students and faculty at the University for field research in Commonwealth countries. Studies resulting from research sponsored by the Center are frequently published by the Duke University Press in the Commonwealth-Studies Series. The Center also distributes in its reprint series selected published articles that relate to the Commonwealth.

Program in Comparative Studies on Southern Asia

The Program in Comparative Studies on Southern Asia was established at Duke University in 1961 following a grant from the Ford Foundation to the Commonwealth-Studies Center to enable it to develop a research and training program on that area. The basic purpose of this program is twofold: to facilitate research on the political and economic development of Commonwealth countries of Southern Asia (India, Pakistan, Ceylon, Malaysia and Brunei) and to provide for the systematic training of graduate students in economics, history, political science, and sociology-anthropology with special emphasis on the area.

The graduate student, in addition to meeting the requirements of the department in which he is enrolled, is expected to take Hindi-Urdu and the cognate courses in other departments and to undertake field research in the preparation of his dissertation. (Chinese is offered at the University of North Carolina.)

The Program awards each year a limited number of pre-doctoral fellowships for graduate studies in the discipline and under the expectations listed above. Awards carrying the same expectations are also made under the NDEA Title VI language fellowships offered by the U. S. Office of Education.

Facilitation and support of research activities by members of the Duke University faculty and graduate students is an important aspect of the Program's activities. It supports through travel grants and subsistence allowances field research by persons affiliated with the University. Research grants for faculty and students are also available from the American Institute of Indian Studies, the United States Office of Education, and the Social Science Research Council. Research facilities include those materials received as a result of the University's participation in a library acquisitions program under the terms of Public Law 480.

The Program has undertaken the publication of two series, one of hard-cover monographs, the other of reprints of articles of note dealing with the Southern Asian region. A third series of occasional papers is proposed.

Hispanic Studies Program

The Graduate School offers an inter-departmental program of Hispanic studies leading to the A.M. and Ph.D. degrees. Students may write their theses and take their degrees in history, economics, political science, sociology, and Hispanic languages and literatures. The purpose of the program is to make possible desirable combinations of courses on the Hispanic world in these related disciplines and to bring to bear more strength of the faculty upon the training of a single candidate. This may be achieved through a judicious use of minors or by such special arrangements as may from time to time become necessary.

The Duke University Library holdings have been built up to facilitate graduate work and research in Hispanic-American cultural history, inter-American relations, economic history, politics, and Spanish-American literature. These collections are being constantly enlarged.

The Population Studies Program

The Population Studies Program at Duke University was established in 1963 as a joint enterprise of the Departments of Economics and Sociology and was charged with both educational and research functions in the area of Demography and Human Ecology.

Training under the auspices of the Program leads to a Ph.D. degree within the Departments of Sociology or Economics with a specialization in Population Studies. Two training regimes are available, one in each department. Each is designed to provide an integrated and cross-disciplinary training in the common speciality area of Population Studies.

In addition to cross-departmental courses, program unity is found through a Population Studies Seminar. This Seminar, which is non-credit and informal, is attended by advanced students and by faculty in both departments. The Seminar provides briefing on demographic research conducted by both faculty and students in the two departments. It also serves as a vehicle for a number of visiting lecturers in demography each semester.

Graduate fellowships for students in the Program are available in either of the two departments.

Oak Ridge Institute of Nuclear Studies

Duke University is one of the sponsoring universities of the Oak Ridge Institute of Nuclear Studies located at Oak Ridge, Tennessee.

The graduate research program at Duke has available to it all the facilities of the Oak Ridge National Laboratory and the cooperative supervision of student research by the staff at Oak Ridge.

Fellowships in several fields of science are available to qualified applicants.

GRADUATE FELLOWSHIP PROGRAM. On application by a university the Institute awards fellowships to candidates for the master's and doctor's degree. The student uses the fellowship to conduct his thesis research in an Oak Ridge laboratory.

AEC SPECIAL FELLOWSHIPS. These are available in the fields of (1) Nuclear Science and Engineering, (2) Health Physics, (3) Advanced Training in Health Physics, and (4) Industrial Hygiene.

The application deadlines differ for different fellowships. Further information may be obtained from Karl M. Wilbur, Department of Zoology.

Cooperative Programs with the Consolidated University of North Carolina

INTERCHANGE OF REGISTRATION. (See pp. 24-25.)

LIBRARY EXCHANGE. Students of both the University of North Carolina and Duke University are granted certain library privileges in the respective libraries of each University. Books unavailable in one library may be procured at short notice through an interlibrary loan service.

THE COOPERATIVE PROGRAM IN THE HUMANITIES. The Cooperative Program in the Humanities, jointly managed by Duke University and the University of North Carolina at Chapel Hill, aims at expanding and improving activities in the humanities in the two universities and throughout the region. The Program was established in 1963, with offices on both campuses, and receives substantial financial support from the Ford Foundation.

The central feature of the Program is a cooperative exchange between the two universities, on the one hand, and a number of liberal arts colleges on the other. Academic-year research leaves are made possible for faculty members from humanistic departments of liberal arts colleges located in Virginia, North Carolina, and South Carolina. These scholars are known as Humanities Fellows. Each Fellow has an important, clearly defined research project. As partial replacements for the Humanities Fellows during their year of leave, the Program offers to the colleges advanced graduate students from the two universities.

The Program sponsors semester visits of distinguished professors in the Humanities. In addition to teaching, these Professors also give occasional public lectures on both campuses. The Program also makes possible shorter visits by well-known foreign humanistic scholars.

The Program has established two editorial internships, filled by advanced graduate students. These graduate students have the opportunity to become familiar with the processes and technical aspects of scholarly publication.

Each spring the Program will sponsor a humanities symposium. Representatives of colleges in the region and several outstanding humanists from other regions will participate, along with all persons directly involved in the Program.

The Program will conduct two summer activities: (1) The Southeastern Institute of Medieval and Renaissance Studies has been established for the advancement of scholarship and the improvement of teaching in the southeastern region. The first Institute will consist of seven informal seminars, each led by a Senior Fellow. Each seminar will have an enrollment of six faculty members from colleges in the southeastern region. Students of all areas of medieval and renaissance studies are invited to participate. (2) A number of Summer Research Awards are available for faculty members at Duke and the University of North Carolina.

Inquiries may be directed to the Program office, 212 Building 9, Duke University.

COOPERATIVE PROGRAM IN RUSSIAN AND EAST EUROPEAN HISTORY. The graduate schools of Duke University and the University of North Carolina offer a cooperative program leading to the M.A. and Ph.D. degrees in Russian and East European history. Students admitted to one institution are encouraged to enroll in those courses in the other that are advantageous to their programs, and to utilize the libraries and facilities of both universities. The holdings of the two libraries in Russian and East European history are substantial and complementary. Both libraries have a policy of purchasing all significant published works in Slavic history, economics, government, geography, literature, and linguistics. Graduate assistantships and fellowships of various types complete the program.

Research and Publications

The several departments of the University are devoted to research as well as to instruction. Since the University exists for the promotion and diffusion of knowledge, attention is rightly placed, in the Graduate School, on research activities.

In furtherance of the University's obligation to promote and diffuse knowledge, the President annually appoints a University Council on Research, which receives applications from members of the various faculties for subsidies in support of research. Vigorous and forward-looking policies of this Research Council have initiated and encouraged the completion of many substantial and important research projects.

The Duke University Press takes its place as a significant agency in the diffusion of knowledge. Created in 1925, as a successor to the Trinity College Press, the Duke University Press continued the publication of the *South Atlantic Quarterly*, published at Trinity College since 1902, and in 1926 revived the *Hispanic-American Historical Review*, which had been founded and published from 1918 to 1922 by a group of scholars interested in Hispanic America. In 1929 *American Literature* was begun with the cooperation of the American Literature Group of the Modern Language Association. This journal was followed in 1931 by *Ecological Monographs*, and in 1932, *Character and Personality* (since 1945 the *Journal of Personality*). In 1935 the Press began the publication of the *Duke Mathematical Journal*. Since 1948 it has published *Ecology*, the official journal of the Ecological Society of America. The Law School of Duke University publishes *Law and Contemporary Problems*, *The Duke Bar Journal*, and *The Journal of Legal Education*.

The Press, since its organization, has published more than three hundred and twenty-five volumes, including four series of monographs, and has thus made public the fruits of scholarly research of the Duke faculty and of scholars elsewhere. In the broadest sense, the policy of the Press is to make available to the public any scholarly work that merits publication though special attention is given to works in domains of knowledge cultivated by the University.

Visiting Scholars

The libraries and, to the extent practicable, other facilities of Duke University will be made available to faculty members of colleges and universities who wish to spend a period of time on the campus in pursuit of their scholarly interests. No fees will be charged such visitors unless they wish to participate in activities for which a special fee is assessed. Room and board may be arranged for at the regular rates in the dormitories and dining rooms. Dormitory space is usually available during the summer months. Inquiries concerning residence for visiting scholars should be directed to the Dean of the Graduate School of Arts and Sciences.

Graduate Study in the Summer Session

The Summer Session of Duke University is divided into two terms. In 1965 the first term will begin on June 12 and will end on July 17. The second term will begin on July 19 and will end on August 24.

Graduate students who wish to work toward advanced degrees in the Summer Session, particularly in chemistry, economics, education, English, history, mathematics, religion, sociology, Spanish, and zoology, will find a selection of courses offered by members of the Duke faculty and by visiting professors. Other departments ordinarily offering work leading to the A.M. degree are botany, political science, and psychology. Thesis research for advanced graduate students is available also in other departments, such as botany, engineering, forestry, and physics.

Requirements for admission to the Graduate School are detailed above. Students who wish to be admitted to the Graduate School for work in the Summer Session should make application to the Dean of the Graduate School, as well as to the Director of the Summer Session, and should return the completed application, with supporting documents, before May 14, for admission to the first term, and before June 20, for admission to the second term.

REGULATIONS REGARDING SUMMER WORK. (a) No graduate student may register for more than six units of credit in one Summer Session term. (b) All of the work required for the A.M., M.A.T., or M.Ed. degree must be completed within six years of the date of beginning. (c) Not more than one year of summer work can be accepted toward the residence requirements beyond the minimum for the Ph.D. or Ed.D. degrees. See p. 26 for a definition of a year's residence credit earned in Summer Sessions. Students who complete in a summer session the work required by the University for the Master's degree will be granted the degree at the end of the summer.

A Summer Session Bulletin containing information about graduate courses may be obtained by addressing a request to the Director of the Summer Session, Duke University, Durham, N. C.

Courses of Instruction

In general, courses with odd numbers are offered in the fall semester, those with even numbers in the spring semester. Double numbers separated by a hyphen indicate that the course is a year-course and must normally be continued throughout the year if credit is received. A student must secure written permission from the instructor in order to receive credit for either semester of a year-course. Double numbers separated by a comma indicate that although the course is a year-course, credit may be received for either semester without special permission.

Normally, courses which bear no date are offered every year; those marked with an asterisk are offered only when the need arises.

Note: In each department the number 399 is reserved to designate special (individual readings in a specified area and supervised by a regular member of the Graduate staff, credit 1-3 units each registration, 9 units maximum in three successive registrations. The course is restricted to resident doctoral programs, should have a completion exercise, and must carry a grade. When used it appears in this form: [Department] 399, Special Reading in [area], (Instructor), [1 to 3] units.

ANATOMY

PROFESSOR MARKEE, CHAIRMAN; ASSOCIATE PROFESSOR DUKE, DIRECTOR OF GRADUATE STUDIES—431 MEDICAL SCHOOL; PROFESSORS EVERETT, HETHERINGTON AND PEELE; ASSOCIATE PROFESSORS BECKER AND MOSES

The Department of Anatomy offers graduate courses and training leading to the A.M. and Ph.D. degrees. Further information may be obtained from the Director of Graduate Studies of the department.

M201. ANATOMY AS RELATED TO LOCOMOTION.—Complete dissection of that part of the body concerned with locomotion and posture. (See also Course M205). September to January. Prerequisite: One year each of biology, chemistry, and physics. 6 units.

PROFESSORS MARKEE AND EVERETT; ASSOCIATE PROFESSORS BECKER AND DUKE

M202. MICROSCOPIC ANATOMY.—Conferences and laboratory work on the morphological characteristics of the tissues of the animal body. The work is based upon a study of fresh and prepared material and is approached from the physiological viewpoint. Sept. to Jan. Hours and credits (maximum 3 units) by arrangement. Prerequisite: adequate training in histology or cytology.

PROFESSORS MARKEE, HETHERINGTON, AND EVERETT; ASSOCIATE PROFESSORS BECKER, DUKE, AND MOSES

M203. ANATOMY OF THE NERVOUS SYSTEM.—A study of the gross and microscopic structure of the human central nervous system, special attention being paid to the structural and functional relationships between the various nuclei and fiber tracts. Feb. to June. Hours and credits (maximum 4 units) by arrangement. Prerequisite: Anatomy M201.

PROFESSORS MARKEE, EVERETT, AND PEELE; ASSOCIATE PROFESSORS BECKER AND DUKE

M204. NEUROANATOMICAL BASIS OF BEHAVIOR.—A study of the gross and microscopic anatomy of the nervous system with emphasis on the structural and functional relationship between tracts, nuclei, and cortical areas. Restricted to graduate students with the equivalent of a major in psychology. (Jan. to June) 3 units.

PROFESSORS HETHERINGTON AND PEELE

M205. ANATOMY OF THE VISCERA.—This is a study of the gross anatomy of the thoracic, abdominal and pelvic organs and the deeper structures of the head.

This course may be taken concurrently with M201. Sept. to Jan. Prerequisites one year each of physiology, chemistry, and physics. 2 units.
PROFESSORS MARKEE, EVERETT; ASSOCIATE PROFESSORS BECKER AND DUKE

M301. GROSS HUMAN ANATOMY.—A course especially for Ph.D. candidates in Anatomy, comprising a complete dissection of the cadaver. The laboratory work is supplemented by conferences which place emphasis on the biological aspects of the subject. Sept. to June. Hours and credits (maximum 8 units) by arrangement. Prerequisite: adequate training in comparative anatomy and embryology.
PROFESSORS MARKEE AND EVERETT; ASSOCIATE PROFESSORS BECKER AND DUKE

M312. RESEARCH.—Individual investigations in the various fields of anatomy. Credits to be arranged. PROFESSORS MARKEE, EVERETT, HETHERINGTON, AND PEELE; ASSOCIATE PROFESSORS BECKER, DUKE, AND MOSES

M313-314. ANATOMY SEMINAR.—Weekly meeting of graduate students and staff in which current research problems in Anatomy will be presented. Required of all graduate students who are candidates for the A.M. or Ph.D. degree. 2 units. Sept. to Jan. PROFESSORS MARKEE, EVERETT, HETHERINGTON, AND PEELE; ASSOCIATE PROFESSORS BECKER, DUKE, AND MOSES

ART

PROFESSORS HALL AND PATRICK; VISITING PROFESSOR BIER; ASSOCIATE PROFESSORS MARKMAN AND SUNDERLAND

No graduate degree is offered in this department, but the following courses are suggested as possible minors for students majoring in history, literature, philosophy, religion, psychology, or sociology, or in any other interested department.

215. RELIGIOUS ART OF THE ANCIENT NEAR EAST.—A specialized study of the development of art, particularly architecture and sculpture, as the material expression of religious ideas in Egypt, Mesopotamia, and in part of Syria and Palestine, to the Persian conquest. 3 units.* (W) ASSOCIATE PROFESSOR MARKMAN

216. RELIGIOUS ART OF THE CLASSICAL WORLD.—A specialized study of the religious art, particularly architecture and sculpture, of Greece and Rome, with special emphasis on the monuments in the Near East. 3 units.* (W)
ASSOCIATE PROFESSOR MARKMAN

217. AEGEAN ART.—A study of the problems of Aegean art as the forerunner of Greek art and in relation to the contemporary civilization of the eastern Mediterranean world. 2 units. (W) ASSOCIATE PROFESSOR MARKMAN

218. EARLY GREEK ART.—A study of the problems of the origin and development of Greek art in the Geometric period to the end of the Archaic. 3 units. (W)
ASSOCIATE PROFESSOR MARKMAN

221-222. HISTORY OF AESTHETICS.—Theories of art and beauty in the western world from antiquity to the present. Some attention will be given to the developed theories of aesthetics in the Far East. 6 units. (E) PROFESSOR PATRICK

233. EARLY MEDIAEVAL ARCHITECTURE.—The development of religious architecture from the time of Constantine to the end of the First Romanesque style in the third quarter of the eleventh century. 3 units. (E)
ASSOCIATE PROFESSOR SUNDERLAND

234. ROMANESQUE SCULPTURE.—The development of sculpture in western Europe from the early Christian period through the culmination of Romanesque art in the west portal of Chartres Cathedral. 3 units. (E)
ASSOCIATE PROFESSOR SUNDERLAND

239. ARCHITECTURE OF BRITAIN.—After a summary of recent archaeological activity in the British Isles, and a survey of Mediaeval building, the course deals principally with changing architectural problems and their solutions from the advent of the Renaissance onward. Attention is given to the interests of students majoring in history or literature. 3 units. (E) ASSOCIATE PROFESSOR HALL

240. ARCHITECTURE OF NORTH AMERICA.—A study illustrating the transplantation of European architectural customs since the sixteenth century; the

time-lag in transit and acceptance of later European developments; the gradual assumption of confident independence in design; and the emergence of international leaders in the United States. 3 units. (E) ASSOCIATE PROFESSOR HALL

292. RESEARCH PROBLEMS IN THE COLLECTIONS OF THE NORTH CAROLINA MUSEUM OF ART.—Students will meet once every week in the museum in Raleigh. Each student will submit a report on his particular research project. 3 units.* (F) VISITING PROFESSOR BIER

BIOCHEMISTRY AND NUTRITION

PROFESSOR HANDLER, CHAIRMAN—237 BELL BUILDING; ASSOCIATE PROFESSOR BYRNE, DIRECTOR OF GRADUATE STUDIES—218 BELL BUILDING; PROFESSOR TANFORD; ASSOCIATE PROFESSORS F. BERNHEIM, DAVIDSON, GUILD, HILL, KAMIN, LYNN, MCCARTY, THIERS, AND WAKIL; ASSISTANT PROFESSORS FRIDOVICH, GREENE, KIRSHNER, ROSETT, AND WHEAT

In the Department of Biochemistry graduate work is offered leading to the Ph.D. degree. A brochure may be requested from the department which describes the departmental facilities, the staff, the Ph.D. program, the special trainee stipends which are available to Ph.D. candidates in Biochemistry, and an M.D.-Ph.D. program.

Prerequisites are specified for each course, but interested students who cannot meet the requirements may be admitted by permission of the instructor.

FOR SENIORS AND GRADUATES

201. INTRODUCTORY BIOCHEMISTRY.—Three lectures and one conference per week. A rigorous introduction to fundamental aspects of biochemistry which emphasizes chemistry of biologically occurring macromolecules, mechanism of enzyme action, energy transformations, metabolic pathways, and biochemical genetics. 4 units. PROFESSOR HANDLER

203. CHEMISTRY OF NATURAL PRODUCTS.—This course will emphasize the organic chemistry of carbohydrates, lipids and steroids; aspects of stereochemistry, conformational analysis and physical methods of structural investigation will be discussed. Prerequisite: chemistry through organic; Biochemistry 201 or its equivalent is suggested. 2 units. (Not 1965-66) ASSOCIATE PROFESSOR DAVIDSON

206. LABORATORY METHODS IN BIOCHEMISTRY.—A laboratory course emphasizing the procedures and instruments of biochemical research. Each technique is employed in the course of a classical experiment demonstrating an important biochemical finding. Because the experimental materials are labile, one full day per week is spent in the laboratory. Prerequisite: Biochemistry 201 or equivalent. 2 units. ASSISTANT PROFESSOR ROSETT

FOR GRADUATES

301. ENERGY METABOLISM.—A lecture and seminar course on the metabolism of carbohydrates, lipids and biological oxidations; emphasizing energy production and utilization. Prerequisites: Biochemistry 201, 203 suggested. 3 units.
ASSOCIATE PROFESSOR WAKIL AND ASSISTANT PROFESSOR WHEAT

302. NITROGEN METABOLISM.—An intensive study, in lecture and seminar, of the metabolism of inorganic nitrogen compounds, proteins, and their component amino acids. Prerequisite: Biochemistry 201. 2 units.
ASSOCIATE PROFESSOR KAMIN AND ASSISTANT PROFESSORS KIRSHNER AND GREENE

304. PROTEINS AND ENZYMES.—The chemical and physical properties of proteins and enzymes. Thermodynamics, kinetics, and mechanisms of enzyme-catalyzed reaction. Prerequisites: Biochemistry 201 and physical chemistry equivalent to Chemistry 261-262. 4 units.
PROFESSOR TANFORD AND ASSOCIATE PROFESSORS HILL AND BYRNE

314. NUCLEIC ACIDS AND GENETIC MECHANISMS.—A lecture and seminar course on nucleic acids in biology with emphasis on the physical and chemical basis of their role as the structural units of heredity. Prerequisite: Biochemistry 201; 203 is suggested. 2 units. (Not 1965-66) ASSOCIATE PROFESSOR GUILD

345-346. SEMINAR.—Required of all graduate students majoring in biochemistry. 1 unit each semester. ASSISTANT PROFESSOR FRIDOVICH

348. SPECIAL TOPICS.—A lecture series on topics of current interest in biochemistry. 1 or 2 units. ASSOCIATE PROFESSOR MCCARTY

BOTANY

ASSOCIATE PROFESSOR JOHNSON, CHAIRMAN—141 BIOLOGICAL SCIENCES BUILDING; PROFESSOR BILLINGS, DIRECTOR OF GRADUATE STUDIES, 142 BIOLOGICAL SCIENCES BUILDING; PROFESSORS ANDERSON, HARRAR, KRAMER, NAYLOR, OOSTING, AND PERRY; ASSOCIATE PROFESSORS CULBERSON, HUMM, PHILPOTT, AND WILBUR; ASSISTANT PROFESSORS STONE AND WHITE

Graduate work in the Department of Botany is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate study in botany a student should have had in his undergraduate program at least 12 semester hours of botany beyond an elementary course, and related work in biological sciences. Some work in chemistry and physics will be desirable and, for some phases of botanical study, a necessity. Graduate Record Examination scores are required of all applicants. The student's graduate program is planned to provide a broad basic training in the various fields of botany, plus intensive specialization in the field of the research problem.

202. GENETICS.—The principles of heredity, their cytological basis, and their bearing on other fields of biology. Laboratory work involves experimental breeding of the fruit fly and interpretation of data from the breeding of plants. Offered in alternate years. Prerequisites: one year of botany, zoology, or equivalent, and one year of college mathematics. 4 units. PROFESSOR PERRY

203. PLANT CYTOLOGY.—A study of the structure and organization of plant cells in relation to growth, reproduction, and especially heredity. Prerequisite: one year of botany. (This is the same course as Zoology 243.) 4 units. PROFESSOR ANDERSON

205. ANATOMY.—Intensive survey of vascular plant cell types, tissues and organs, with emphasis on the modern application of anatomy to problems of systematics and phylogeny. Laboratories will include microtechnique. Special project and term paper stressing current techniques and literature required. Prerequisite: Permission of instructor. 4 units. ASSISTANT PROFESSOR WHITE

209. LICHENOLOGY. The morphology, systematics, and biological and ecological implications of the lichens. Collection and identification of specimens and the use of lichen chemistry in taxonomy. Prerequisite: Two semesters of botany. 3 units. ASSOCIATE PROFESSOR CULBERSON

210. BRYOLOGY. The morphological, systematic, and ecological characteristics of mosses and liverworts. 3 units. PROFESSOR ANDERSON

212. PHYCOLOGY. The morphological and ecological characteristics of the common freshwater and marine species and the principles underlying their classification. Collecting, identification, and the making of permanent microscopical preparations. 3 units. ASSOCIATE PROFESSOR HUMM

218. COMPARATIVE MORPHOLOGY OF VASCULAR PLANTS. Fundamental anatomical and morphological problems and theories in relation to vascular plant evolution, with emphasis on comparative vegetative and reproductive characters as indicators of evolutionary trends. Laboratory work stresses basic techniques in preparation of materials, analysis of results and correlation with data in current literature. Prerequisite: Botany 55 or permission of instructor. 4 units. ASSISTANT PROFESSOR WHITE

221. MYCOLOGY.—Field and laboratory study of the vegetative and reproductive structures of the fungi and slime molds. Methods of collection, isolation, propagation, and identification of the major orders as represented in the local flora. Prerequisite: one year of biological science. 4 units. ASSOCIATE PROFESSOR JOHNSON

225-226. SPECIAL PROBLEMS.—Students with adequate training may do special work in the following: (1) Mycology and Plant Pathology, (2) Cytology, (3) Ecology,

(4) Genetics, (5) Morphology and Anatomy of Higher Groups, (6) Morphology and Taxonomy of Lower Groups, (7) Physiology, (8) Taxonomy of Higher Groups, (9) Microbiology, (10) Experimental Taxonomy and Evolution. Credits to be arranged. ALL MEMBERS OF THE GRADUATE STAFF

240. PLANT EVOLUTION.—Microevolutionary change and factors influencing its rate and direction, with primary emphasis on examples from the plant world. 3 units. ASSISTANT PROFESSOR STONE

242. SYSTEMATICS.—A general survey of the principles of vascular plant taxonomy, with practice in identification and collection. Special project or term paper required. Lectures, laboratories, and field trips. Prerequisite: Permission of instructor. 4 units. ASSOCIATE PROFESSOR WILBUR

245. MORPHOLOGY.—Comparative survey of vegetative organization and reproductive cycles in the modern flora, with emphasis on evolutionary orgin and phylogeny. Special project and term paper required. Lectures, laboratories and field trips. Prerequisite: Permission of instructor. 4 units.
ASSOCIATE PROFESSOR CULBERSON

246. ECOLOGY.—Intensive study of the environmental effects on growth and distribution of plants at the level of the individual, the population, and the ecosystem. A term paper will be required. Lectures, laboratories and field trips. Prerequisite: Permission of instructor. 4 units. PROFESSOR BILLINGS

251. PHYSIOLOGY.—A general survey of the major physiological processes in plants, including food syntheses, growth and water relations. Special project and term paper required. Lectures, laboratories, and readings. Prerequisite: Permission of instructor. 4 units. PROFESSOR KRAMER

252. PLANT METABOLISM.—The physiochemical processes and conditions underlying the physiological processes of plants. Prerequisite: Botany 151 or equivalent; organic chemistry recommended. 4 units. PROFESSOR NAYLOR

254. PLANT WATER RELATIONS.—A study of factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Assigned readings, reports, and lectures. Prerequisite: Botany 151 or equivalent. 3 units. PROFESSOR KRAMER

255. PLANT SYSTEMATICS.—A study of the historical background of plant taxonomy, modern concepts and systems of classifications, nomenclatorial problems, and the taxonomy of specialized groups. Prerequisite: two years of botany, including Botany 52 or equivalent. 4 units. ASSOCIATE PROFESSOR WILBUR

256. COMMUNITY ANALYSIS AND CLASSIFICATION.—The development of concepts and methods in synecology and their present application to the study of plant communities. Prerequisite: Botany 156 or equivalent. 3 units.
PROFESSOR OOSTING

257. PRINCIPLES OF PLANT DISTRIBUTION.—Interpretation of floristic and ecological plant geography of world vegetation. Prerequisite: Botany 156 or equivalent. 3 units. PROFESSOR BILLINGS

258. PHYSIOLOGY OF GROWTH AND DEVELOPMENT.—Consideration of the internal factors and processes leading to the production of new protoplasm and its differentiation at the cellular, tissue, and organ level in plants. Prerequisites: Botany 151 or equivalent; organic chemistry recommended. 4 units.
PROFESSOR NAYLOR

259. THE ENVIRONMENT.—Environmental principles and methods of obtaining and evaluating climatological data for ecological purposes with special attention to instrumentation and microclimate. Prerequisite: Botany 156 or equivalent. 3 units. PROFESSOR BILLINGS

305. VEGETATION OF NORTH AMERICA.—Distribution and limits of the major plant communities, a study in ecological plant geography. Prerequisite: Botany 156 or equivalent. 3 units. PROFESSOR OOSTING

359-360. RESEARCH IN BOTANY.—Individual investigation in the various fields of botany. Credits to be arranged. ALL MEMBERS OF THE GRADUATE STAFF

CHEMISTRY

PROFESSOR SAYLOR, CHAIRMAN—115 CHEMISTRY BUILDING; PROFESSOR BRADSHER, DIRECTOR OF GRADUATE STUDIES—124 CHEMISTRY BUILDING; PROFESSORS BROWN, GROSS, HAUSER, HILL, HOBBS, KRIGBAUM, STROBEL, AND WILDER; ASSOCIATE PROFESSORS POIRIER, QUIN, AND SMITH; ASSISTANT PROFESSORS JEFFS, JONES, TOREN, AND WELLS; ADJUNCT PROFESSORS PETERLIN AND STANNETT

In the Department of Chemistry graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking a graduate program in chemistry, a student should have taken an undergraduate major in chemistry, along with related work in mathematics and physics.

Graduate courses in the department are designed to provide a broad basic training in the fields of inorganic, organic, analytical, and physical chemistry. An important requirement for the Ph.D. degree is the successful completion, under the direction of a member of the staff, of a research program leading to the solution of an original problem. The choice of the research problem, for either the A.M. or the Ph.D. degree, will determine the field of advanced specialization.

FOR SENIORS AND GRADUATES

206. ELEMENTS OF THEORETICAL CHEMISTRY.—A one-semester course in the general principles of physical chemistry. Credit is not given for both 206 and 161-162. Three recitations and three laboratory hours. Prerequisites: quantitative analysis, organic chemistry 8 units; physics 8 units, and introductory calculus. With the permission of the Director of Graduate Studies, graduate students from other departments may offer other advanced science courses in lieu of some of these prerequisites. 4 units. PROFESSOR SAYLOR

215. ADVANCED INORGANIC CHEMISTRY.—A study of modern theories of valence and molecular structure and inorganic compounds, particularly the less common types. Prerequisite: Physical Chemistry. 3 units. PROFESSOR HILL

216. NUCLEAR CHEMISTRY.—Elementary theory of nuclear reactions, properties of isotopes, and tracer techniques. Two lectures and three laboratory hours. Prerequisites: Introductory physics, analytical and organic chemistry. 3 units. PROFESSOR HILL

234. CHEMICAL INSTRUMENTATION.—Discussion of physico-chemical principles as applied to instrumental methods of analysis, illustrated by laboratory experiments with emphasis on methods involving electrical techniques. One lecture and three laboratory hours per week. Prerequisites: quantitative analysis and physical chemistry; the latter may be taken concurrently. 2 units. PROFESSOR STROBEL AND ASSISTANT PROFESSOR TOREN

251. QUALITATIVE ORGANIC ANALYSIS.—Systematic identification of organic compounds, including a study of solubilities and classification reactions. One lecture and three or six laboratory hours per week. Prerequisites: quantitative analysis and 8 units of organic chemistry. 2 or 3 units. ASSOCIATE PROFESSOR QUIN

252. ADVANCED ORGANIC PREPARATIONS.—A laboratory course designed to supplement the student's knowledge of fundamental organic processes by a selected group of laboratory exercises accompanied by oral discussions of techniques and theories pertinent to the experiments. Five hours laboratory and lecture, with lectures in alternate weeks. Prerequisites: quantitative analysis and 8 units of organic chemistry. 2 units. PROFESSOR BROWN

253. INTERMEDIATE ORGANIC CHEMISTRY.—An advanced study of the reactions of organic compounds and the theories of organic chemistry. Prerequisite: 8 units of organic chemistry. 3 units. ASSOCIATE PROFESSOR QUIN

271. INTRODUCTION TO RESEARCH.—Lectures on the use of chemical literature, research methods, recording and publication of results, and other topics. One lecture per week. 1 unit. PROFESSOR BROWN

275, 276. RESEARCH.—The aim of this course is to give instruction in methods

used in the investigation of original problems. Individual work and conferences. 1 to 6 units. ALL MEMBERS OF THE GRADUATE STAFF

FOR GRADUATES

303. THERMODYNAMICS.—Fundamental laws of thermodynamics and their application to chemistry. Prerequisites: Physical chemistry and one year of calculus. 3 units. PROFESSOR SAYLOR

304. PHYSICAL CHEMISTRY OF REACTIONS.—The theoretical aspects of reaction kinetics, chemical equilibrium, atomic and molecular forces, and the relation of these to chemical reactions are considered. Prerequisite: Physical chemistry. ASSOCIATE PROFESSOR SMITH

306. SPECIAL TOPICS IN PHYSICAL CHEMISTRY.—An introduction to the theory and to the application to physico-chemical problems of statistical thermodynamics, molecular spectroscopy, nuclear and electron magnetic resonance spectroscopy, intra- and inter-molecular interactions, and other selected topics.

Registration for other than chemistry graduate students by permission of the instructor. 3 units. PROFESSOR HOBBS

331, 332. SEMINAR IN ANALYTICAL AND INORGANIC CHEMISTRY.—Lectures, oral reports, and discussion on advanced topics and recent advances in the allied fields of analytical and inorganic chemistry. Prerequisites: Chemistry 215 and 234. 2 units. PROFESSORS HILL AND SAYLOR

342. ADVANCED ORGANIC CHEMISTRY.—Consideration is given to principles, theories and mechanism, as well as the usefulness in reactions, of organic reactions involving basic and acidic reagents. Prerequisite: Chemistry 253. 2 units. PROFESSOR HAUSER

350. ORGANIC REACTIONS.—A study of the scope and limitations of the more important types of reactions of organic chemistry from the point of view of their practical use in the synthesis of organic compounds. Prerequisite: Chemistry 253. 2 units. (Not 1965-66). PROFESSOR BRADSHER

352. MECHANISMS OF ORGANIC REACTIONS.—Mechanisms of various organic reactions are considered. Lecture or seminar one hour each week. Prerequisite: Chemistry 342. 1 unit. PROFESSOR HAUSER

353. SPECIAL TOPICS IN ORGANIC CHEMISTRY.—Various topics of interest to the organic chemist will be surveyed such as the chemistry of heterocyclic compounds, organometallic and organometalloid chemistry, terpenes, sesquiterpenes and steroids, small ring compounds, ring formation and transannular interactions. 2 units. ASSISTANT PROFESSOR JEFFS

354. STEREOCHEMISTRY.—A study of recent advances in stereochemistry of organic compounds including conformations and stereospecific reactions. The use of spectrophotometric methods for the determination of structure will be discussed. Prerequisites: Chemistry 251 and 341. 2 units. PROFESSOR WILDER

360. POLYMER CHEMISTRY.—A survey of the methods of preparation of high-molecular-weight organic compounds and a study of the properties characteristic of macromolecules in solution and in the solid state. Prerequisite: Chemistry 303. 2 units. PROFESSOR KRIGBAUM

361. ADVANCED POLYMER CHEMISTRY.—A number of topics in the chemistry and physics of high polymers will be discussed, including polymerization mechanisms and kinetics, crystallization and morphology of high polymers and solution properties. Prerequisite: Chemistry 360. 2 units. ADJUNCT PROFESSORS PETERLIN AND STANNETT

363, 364. SEMINAR IN PHYSICAL CHEMISTRY.—Various topics in Physical Chemistry which are of special interest to the staff or students are considered such as absorption and scattering of light, dielectric phenomena, electrode processes, electrolyte theory ion exchange, molecular structure and solubility. Seminar. Prerequisites: Physical chemistry and Chemistry 303. 2 units. PROFESSORS HILL, HOBBS, KRIGBAUM, SAYLOR, AND STROBEL; ASSOCIATE PROFESSORS SMITH AND POIRIER

365, 366. CHEMICAL PHYSICS, STATISTICAL THEORY.—General introduction to classical and quantum statistical mechanics and applications to chemical problems including: calculation of thermodynamic functions of gases, liquids and solids; solution theory; reaction velocity; and changes of state. 6 units. (365, Spring 1965-66; 366, Not 1965-66). ASSOCIATE PROFESSOR POIRIER

367, 368. CHEMICAL PHYSICS, QUANTUM THEORY.—General introduction of the quantum theory of atomic and molecular forces and the structure of matter. 6 units. (367, Not 1965-66; 368, Fall 1965-66). ASSISTANT PROFESSOR JONES

373, 374. SEMINAR.—Required of all graduate students in chemistry. One hour a week discussion. 2 units. ALL MEMBERS OF THE GRADUATE STAFF

CLASSICAL STUDIES

PROFESSORS ROGERS, TRUESDALE, ULLMAN, AND WILLIS

GREEK

FOR SENIORS AND GRADUATES

201-202. GREEK TRAGEDY. 6 units.* PROFESSOR TRUESDALE

257. SOCIAL AND CULTURAL HISTORY OF THE HELLENISTIC WORLD FROM ALEXANDER TO AUGUSTUS.—Lectures, reading, and discussions. This course will not be separately credited without the sequel, Latin 258. 3 units. PROFESSOR ROGERS

LATIN

FOR SENIORS AND GRADUATES

205-206. MEDIAEVAL LATIN.—Reading of selections from representative writers in prose and poetry. Practice in dealing with microfilms of mediaeval Latin texts. 6 units.* PROFESSOR ULLMAN

211-212. ROMAN ORATORY.—A survey of the history of Roman oratory, centering about the *Brutus* of Cicero and Tacitus' *Dialogus*. 6 units.* PROFESSOR ROGERS

258. SOCIAL AND CULTURAL HISTORY OF THE GRAECO-ROMAN WORLD.—The Roman Empire as the trustee of Hellenism and Christianity, and its own original contributions to modern civilization; lectures, readings, and discussions. This course continues Greek 257 and will not be separately credited. 3 units. PROFESSOR ROGERS

RELATED COURSES IN OTHER DEPARTMENTS

Philosophy 217; Religion 217, 313, 316, 318.

Under the terms of a co-operative agreement graduate students of Duke University may, with the approval of the chairman of their major department, take any graduate course offered by the Department of Greek and Latin of the University of North Carolina by the payment of a nominal fee. A list of these courses will be sent upon request.

Graduate students of Duke University may attend the American School of Classical Studies in Athens, Greece, without charge for tuition, and they are eligible to compete for the fellowships that are offered annually by the School. These consist of two fellowships in Greek archaeology, and one in the language, literature, and history of ancient Greece, each with a stipend of $2,000. They are awarded mainly on the basis of examination held in the beginning of February of each year. A somewhat similar connection exists with the American Academy in Rome.

COMPARATIVE LITERATURE

No graduate degree is offered in Comparative Literature. The following courses may serve in the minor programs of students in other departments. Professor Salinger is Chairman of the Department of Germanic Languages and Literature.

201, 202. ROMANTICISM.—Studies in the origin, rise and development of the Romantic Movement in the chief literatures of the Western World. The approach is comparative; the principal emphasis will be on England, France, and Germany with some reference to other countries. Selected subjects will occasionally be covered in lectures by speakers from various departments of the University. 6 units. (Not 1965-66). PROFESSOR SALINGER

203, 204. REALISM AND SYMBOLISM.—Comparative studies in the literatures of England, France, Germany, Russia, the Scandinavian countries, Spain and Italy, tracing the decline of romantic individualism and the reappraisal of man's significance against the social background. Selected subjects will occasionally be covered in lectures by speakers from various departments of the University. 6 units. (1965-66). PROFESSOR SALINGER

205. FOUNDATIONS OF TWENTIETH-CENTURY EUROPEAN LITERATURE.—The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Anouilh, Lagerkvist, Camus) evolving toward a mythology of man. 3 units. (Not 1965-66). PROFESSOR SALINGER

(See also Germanic Languages and Literature 206, Middle High German: The Arthurian Romance in Germany.)

ECONOMICS

PROFESSOR SMITH, CHAIRMAN—306 SOCIAL SCIENCE; PROFESSOR SPENGLER, ACTING DIRECTOR OF GRADUATE STUDIES—322 LIBRARY; PROFESSORS BLACK, DE VYVER, FERGUSON, HANNA, HOOVER, LANDON, MCGEE, AND VISITING PROFESSORS INGRAM AND KREPS; ASSOCIATE PROFESSORS BLACKBURN, DAVIES, GERHARD, GOODWIN, AND YOHE; ASSISTANT PROFESSORS DE ALESSI, NAYLOR, AND WALLACE

The Department of Economics offers graduate work leading to the A.M. and Ph.D. degrees. A student entering graduate work in economics should have completed with satisfactory grades at least 12 semester hours of undergraduate work in economics, including 6 hours of Principles of Economics. Among the undergraduate courses of distinct advantage to the graduate student in economics are General Accounting, Elementary Statistics, Intermediate Economic Theory, Money and Banking, International Trade, and basic courses in philosophy, psychology, mathematics, and social sciences other than economics.

Requirements for the Ph.D. in economics include a core of courses in Mathematical Economics, Statistical Methods, Micro- and Macro-economic Theory, Economic History, and the History of Economic Thought. Economic Growth and Demography, Money and Banking, International Trade, Economic Systems, Labor Economics, Public Finance, and Industrial Organization are optional fields, of which the student elects at least three in preparation for the preliminary doctoral examination. Course requirements for the Ph.D., including a minor field, may be completed in four semesters of residence.

FOR SENIORS AND GRADUATES

218. BUSINESS CYCLES.—The characteristics and measurement of cyclical fluctuations in output, employment, and prices; an historical survey of business cycle theories, modern macroeconomic theory and public policy as they relate to business cycles and associated problems of economic growth; techniques of forecasting cycles. 3 units.† ASSOCIATE PROFESSOR YOHE

233. STATE AND LOCAL FINANCE.—A study of expenditures, taxation, and financial administration in state and local governments with emphasis on current problems. Special attention will be given to research methods and materials and to the financial relations between state and local governments. 3 units.† ASSOCIATE PROFESSOR DAVIES

237-238. STATISTICAL METHODS.—A study of statistical methods appropriate for dealing with problems in business and the social sciences. In addition to developing more thoroughly the subject considered in *Business Statistics*, the following methods will be considered: multiple, partial, and curvilinear correlation; curve fitting; probability; sampling distributions: and statistical inference. Pre-

requisite: Economics 138 or consent of the instructor. Either semester may be taken for credit. 6 units. PROFESSOR HANNA AND ASSISTANT PROFESSOR WALLACE

244. INTRODUCTION TO ECONOMETRICS.—A course in which the tools of economic theory, mathematics, statistical inference, electronic data processing are applied to the analysis of economic phenomena. The main objective is to give empirical content to economic theory. Matrix algebra is used to develop topics in statistical inference, classical linear regression, extensions of linear regression, and systems of simultaneous linear equations. Liberal use is made of the electronic computer as a means of estimating and testing the statistical significance of parameters of econometric relationships. 3 units.

262. TRADE UNIONISM AND COLLECTIVE BARGAINING.—An intensive survey of the trade union as an economic institution is followed by a study of the principles and problems of union-management relationship as found in collective bargaining. 3 units.† PROFESSOR DE VYVER

265. INTERNATIONAL TRADE AND FINANCE.—A study of the fundamental principles of international trade and foreign exchange. Subjects covered will include international specialization, balance of payments, foreign investments, tariffs and commercial policies, exchange control, exchange rates, and international monetary problems. 3 units.† ASSOCIATE PROFESSOR GERHARD

275-276. ADVANCED INDUSTRIAL ACCOUNTING AND MANAGEMENT.—A comprehensive examination of the rationale and techniques of control methods used in industry. Emphasis is laid on a critical evaluation of the practices followed by job-order, process, and standard costing, as well as the economics of overhead costs. Prerequisites: Economics 171-172 and permission of the Department. 6 units. PROFESSOR BLACK

301. ECONOMIC ANALYSIS.—Review of contemporary theory relating to consumer behavior, production, the firm, price formation, income distribution, and equilibrium. 3 units. ASSISTANT PROFESSOR DE ALESSI

304, 305. SEMINAR IN MONEY AND BANKING.—3 units each. ASSOCIATE PROFESSOR YOHE AND VISITING PROFESSOR KREPS

307. QUANTITATIVE ANALYSIS, I.—A systematic analysis of the principal quantitative methods used in microeconomic theory. Neo-classical theories of production and distribution are used as vehicles for presenting the material. Considerable emphasis is placed on the application of mathematical analysis to economic models. 3 units. PROFESSOR FERGUSON

308. QUANTITATIVE ANALYSIS, II.—Linear economic models, particularly Leontief models, are used in the exposition. Primary emphasis is placed on the application of mathematics to economic theory. Prerequisite: Economics 307 or consent of instructor. 3 units. PROFESSOR FERGUSON

311, 312. HISTORY OF POLITICAL ECONOMY.—A detailed review of the development of economic theory, the tools of economic analysis, and economics as a science, together with an analysis of the circumstances affecting this development. Period covered: pre-Christian times through 1936. 6 units. PROFESSOR SPENGLER

313-314. SEMINAR IN ECONOMIC THEORY.—The course consists of directed research in economic theory. The primary purpose is the correction of authoritative eclecticism and its replacement by individually integrated theory. Prerequisite: Economics 301 or its equivalent. 6 units. PROFESSORS HOOVER AND FERGUSON

315. SEMINAR IN ECONOMIC SYSTEMS.—3 units. PROFESSOR HOOVER

316. SEMINAR IN ECONOMIC FUNCTIONS OF THE STATE.—3 units. PROFESSOR HOOVER

317. SEMINAR IN DEMOGRAPHIC, POPULATION, AND RESOURCE PROBLEMS.—3 units. PROFESSOR SPENGLER

319. SEMINAR IN THE THEORY AND THE PROBLEMS OF ECONOMIC GROWTH AND CHANGE.—3 units. PROFESSOR SPENGLER

320. SEMINAR IN TRADE CYCLE, EMPLOYMENT, AND INCOME THEORY.—3 units. ASSOCIATE PROFESSORS YOHE AND BLACKBURN

329. FEDERAL FINANCE.—A study of the expenditures, revenues, and financial administration of the government of the United States, with emphasis on current problems. Special attention given to budgetary procedure, corporate and individual income taxes, and the financial relations between federal and state governments. 3 units. ASSOCIATE PROFESSOR DAVIES

330. SEMINAR IN PUBLIC FINANCE.—3 units. ASSOCIATE PROFESSOR DAVIES

331. SEMINAR IN ECONOMIC HISTORY.—3 units. PROFESSOR SMITH

340. NATIONAL INCOME.—A critical survey of the conceptual framework and structure of national income and its components, the reliability of national income estimates, and their use in analyzing questions of economic policy. 3 units. PROFESSOR HANNA

355. SEMINAR IN LABOR ECONOMICS.—3 units. PROFESSOR DE VYVER

358. SEMINAR IN LABOR MARKET AND RELATED ANALYSIS.—3 units. ASSOCIATE PROFESSOR GOODWIN

365. SEMINAR IN INTERNATIONAL TRADE.—3 units. VISITING PROFESSOR INGRAM

366. SEMINAR IN PROBLEMS IN INTERNATIONAL TRADE AND FINANCE.—The seminar will discuss selected topics of current interest, such as the European Common Market, international commodity agreements, migration of labor, amending the IMF charter, and the U.S. gold drain. Prerequisite: Economics 365 or equivalent. 3 units. ASSOCIATE PROFESSOR GERHARD

386. SEMINAR IN LATIN-AMERICAN ECONOMIC PROBLEMS.—3 units. PROFESSOR SMITH

388. INDUSTRIAL ORGANIZATION.—The theory, measurement and history of the firm-structure of industry. Emphasis upon the structure of American industry and upon actual production and pricing practices. Criteria for evaluating industrial performance. 3 units. PROFESSOR MCGEE

389. SEMINAR IN INDUSTRIAL AND GOVERNMENTAL PROBLEMS.—3 units. PROFESSOR MCGEE

401. SEMINAR ON THE BRITISH COMMONWEALTH.—3 units. PROFESSORS SPENGLER, COLE, AND HAMILTON

RELATED COURSES IN OTHER DEPARTMENTS

Courses comprising a candidate's minor may be selected from fields of forestry, history, mathematics, philosophy, physics, political science, psychology, and sociology and anthropology, or from an area that complements the candidate's area of research interests in economics.

EDUCATION

PROFESSOR CARTWRIGHT, CHAIRMAN—08D WEST DUKE BUILDING; PROFESSOR BOLMEIER, DIRECTOR OF GRADUATE STUDIES—08D WEST DUKE BUILDING; PROFESSORS BOWMAN, HOPKINS, HURLBURT AND STUMPF; ASSOCIATE PROFESSORS COLVER, GITHENS, GEHMAN, PETTY, RUDISILL, SHUMAN, SUBLETT, AND WEITZ; ASSISTANT PROFESSOR MARTIN

FOR SENIORS AND GRADUATES

Graduate work in Education is offered leading to the A.M., the M.Ed., the M.A.T., and Ed.D. degrees. For each of these degrees there are specific requirements and prerequisites, all of which may be found stated in detail in this *Bulletin*, pp. 30-41. Department requirements and prerequisites for all of these degrees may be obtained from the Director of Graduate Studies.

From the courses listed below, plus several in related disciplines, a selection may be made which will meet North Carolina requirements for the Advanced Principal's Certificate and the Superintendent's Certificate.

† Graduate students in Economics normally will not receive credit for courses so marked. These courses may be taken for credit by non-Economics graduate students, with the consent of the instructor.

(Some courses below are offered only in the Summer Session; see the Summer Session *Bulletin*.)

Accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's degree as the highest degree approved.

201. TEACHING AND SUPERVISION OF ARITHMETIC.—This course gives special attention to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. The course will consider the meaning theory, method of teaching, problem solving, evaluation, practice and drill, and selection and gradation of arithmetical contents. The course is designed for teachers and supervisors in the elementary school. 3 units.
ASSOCIATE PROFESSOR PETTY

203. PRINCIPLES OF SCHOOL ADMINISTRATION.—The fundamental facts and procedures of school administration, and analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. 3 units. PROFESSORS BOLMEIER, HURLBURT, AND STUMPF

204. THE SCHOOL AS AN INSTITUTION.—Consideration is given to the place of the school in the American social order, and its adaption to social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunity. 3 units. PROFESSOR BOLMEIER AND ASSISTANT PROFESSOR MARTIN

205. CURRICULUM PROBLEMS IN SECONDARY EDUCATION.—A consideration of the aims and objectives of secondary-school subjects, emphasizing practical problems of curriculum-making in the high school. 3 units.*
PROFESSOR CARTWRIGHT

210. INTRODUCTION TO EDUCATIONAL RESEARCH.—The general purpose of this course is to give the student an overview of research, acquaint him with the nature of research processes, and develop within him an appreciation of the essential characteristics of good research. 3 units. PROFESSOR STUMPF

211. THE PROBLEM CHILD (also listed as Psychology S211).—Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 3 units.

213. ELEMENTARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the elementary-school staff. The scope of elementary education is considered to encompass nursery school, kindergarten, and the elementary school. Special treatment is given to the problems of internal organization and management of the elementary school, and its integration with the secondary-school level. 3 units.* PROFESSOR STUMPF AND ASSOCIATE PROFESSOR SUBLETT

215. SECONDARY EDUCATION: PRINCIPLES.—Intensive study of principles, curriculum, and methods in secondary education. Accelerated course meeting six hours a week for half a semester. Must be accompanied by Education 216. 3 units.
PROFESSORS CARTWRIGHT, GITHENS, AND HURLBURT;
ASSOCIATE PROFESSORS SHUMAN AND SUBLETT

216. SECONDARY EDUCATION: INTERNSHIP.—Supervised internship in junior or senior high schools. Full-time observation and teaching for half a semester, accompanied by Education 215; or, with permission of the Department, full-time teaching for a semester, accompanied by Education 315. Students carrying Education 216 for credit toward a master's degree will be required to take six hours of senior or graduate work in addition to the normal degree requirements. 6 units. PROFESSORS CARTWRIGHT, GITHENS, AND HURLBURT;
ASSOCIATE PROFESSORS SHUMAN AND SUBLETT

217. THE PSYCHOLOGICAL PRINCIPLES OF EDUCATION.—An advanced

study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 3 units.

ASSOCIATE PROFESSORS GEHMAN AND WEITZ

222. THE CURRICULUM AND MATERIALS OF THE ELEMENTARY GRADES.—A study of curriculum problems in the elementary schools. 3 units.*

PROFESSOR HURLBURT AND ASSOCIATE PROFESSOR SUBLETT

224. TEACHING THE SOCIAL STUDIES IN ELEMENTARY SCHOOLS.—This course will treat objectives, curriculum trends, methods, and materials in elementary-school social studies. Topics to receive emphasis include unit-planning, use of the textbook, the reading program, using community resources, audio-visual materials, dealing with controversial issues, teaching time and place concepts, and evaluation. Opportunity will be provided for teachers to work on their own school problems in the social studies. 3 units. PROFESSOR CARTWRIGHT

225. THE TEACHING OF HISTORY AND THE SOCIAL STUDIES.—Evaluation of the objectives, content, materials, and methods in the teaching of history and the social studies. 3 units. PROFESSOR CARTWRIGHT

226. TEACHING READING IN THE ELEMENTARY SCHOOL.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. 3 units. ASSOCIATE PROFESSOR RUDISILL

228. IMPROVEMENT OF INSTRUCTION IN THE SOCIAL STUDIES.—An advanced treatment of curriculum, methods, and materials in the social studies. Individuals will concentrate on subjects and grade levels of their choice. 3 units.

PROFESSOR CARTWRIGHT

232. SUPERVISION OF INSTRUCTION.—A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to community needs. 3 units.* PROFESSOR HURLBURT

234. SECONDARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 3 units. PROFESSOR BOLMEIER

235. THE NATURE, FUNCTION, AND REORGANIZATION OF THE CURRICULUM.—Selected problems guiding the reading of students. 3 units.

PROFESSOR CARTWRIGHT AND ASSOCIATE PROFESSOR SUBLETT

236. TEACHING READING IN THE SECONDARY SCHOOL.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. The course provides practice with secondary-school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during a six-week period. For secondary-school teachers of all subjects who wish to improve the reading and study habits of their students. 3 units.

ASSOCIATE PROFESSOR RUDISILL

237. LITERATURE FOR ADOLESCENTS.—This course offers a critical survey of literature written for, or appropriate for junior and senior high school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 3 units. ASSOCIATE PROFESSOR SHUMAN

238. REMEDIAL READING—PRINCIPLES AND PRACTICE.—A study of the basic causes of reading disability and of principles, methods, and materials for the diagnosis and correction of specific difficulties. The course provides practice with grade school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during the six-week period. A basic course in the psychology of teaching of reading is prerequisite, or Education 226 may be taken concurrently. 3 units. ASSOCIATE PROFESSOR RUDISILL

239. METHODS AND PROBLEMS OF TEACHING ENGLISH IN SECOND-

ARY SCHOOLS.—This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar, and composition. Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles in the field. Several short compositions and a report will be required. 3 units.

PROFESSOR BOWMAN AND ASSOCIATE PROFESSOR SHUMAN

240. EDUCATIONAL AND OCCUPATIONAL INFORMATION.—A study of the sources of occupational and educational information: methods of securing and organizing occupational information; methods of providing vocational and educational information to students through career days, college conferences, class activities, and individual counseling; methods of making job analyses and community occupational surveys. 3 units.* ASSOCIATE PROFESSOR COLVER

241. PRINCIPLES OF GUIDANCE.—An historical survey of the philosophies of guidance; a study of the interrelationships between instruction, administration, and guidance in education. Prerequisite: 6 hours of psychology or educational psychology. 3 units. ASSOCIATE PROFESSOR COLVER

242. MEASUREMENT OF APTITUDES, INTEREST, AND ACHIEVEMENT.—A study of the theories and principles of psychological measurement as applied to aptitude, interest, and achievement testing (also listed as Psychology 242). Prerequisite: 12 hours of psychology or educational psychology (6 hours of which may be taken concurrently). 3 units.

243. PERSONALITY DYNAMICS.—A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 3 units.

ASSOCIATE PROFESSOR GEHMAN

244. COUNSELING TECHNIQUES.—A study of individual counseling techniques including diagnosis, interviewing, program planning, and counseling evaluation. Prerequisites: Education 242 and 243 or equivalent, which may be taken concurrently. 3 units. ASSOCIATE PROFESSOR GEHMAN

246. THE TEACHING OF MATHEMATICS.—This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. 3 units. ASSOCIATE PROFESSOR REYNOLDS

248. PRACTICUM IN COUNSELING.—Practice in individual counseling, including test administration, intake interviewing, diagnosis, counseling, program planning, report preparation, and evaluation. The student will be expected to devote about 150 hours to case work and conferences with his supervisor. Prerequisite: Education 244. 3 units. ASSOCIATE PROFESSOR WEITZ

249. INTRODUCTION TO EXCEPTIONAL CHILDREN.—Survey course in special education covering the educational, psychological, medical and social aspects of exceptional children. Field experiences including emotionally disturbed, mentally retarded, neurologically impaired, physically handicapped, crippling and special health conditions, socially and culturally deprived and gifted children. (Opportunities for attendance at psychiatric, psychological, and educational demonstrations with exceptional children.) 3 units. ASSISTANT PROFESSOR STEDMAN

250, 251. TEACHING EMOTIONALLY DISTURBED CHILDREN: INTERNSHIP.—Basic principles and practices in teaching and the organization of instructional materials. Work with children under the supervision of a certified teacher of emotionally disturbed children. Experience in general classroom teaching and small group and individualized instruction. Participation in staff conferences involving psychiatrists, psychologists, social case workers, and professional educators. 3 units each semester. ASSOCIATE PROFESSOR PETTY

252. THE SCHOOL IN THE LEGAL STRUCTURE.—Designed to show the legal relationships of the school to federal, state, and local governments. Considerable attention to legal rights, responsibilities, and liabilities of the teacher. Not open to those who have had Education 253. 3 units. PROFESSOR BOLMEIER

253. SCHOOL LAW.—The primary purpose of this course is to familiarize prospective school administrators and teachers with the legal features of school organi-

zation and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 3 units. PROFESSOR BOLMEIER

258. EDUCATIONAL MEASUREMENTS.—A critical study of the principles and techniques involved in measurement in education, with opportunity for individual research. Prerequisite: twelve semester hours in the Department, including a course in educational psychology. 3 units. ASSOCIATE PROFESSORS COLVER AND WEITZ

266. SCIENCE IN THE ELEMENTARY SCHOOL.—Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equipment, and field studies. 3 units.* PROFESSOR GITHENS

276. THE TEACHING OF HIGH-SCHOOL SCIENCE.—Discussion, lectures and collateral reading, related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for secondary-school science. 3 units. PROFESSOR GITHENS

285. AUDIO-VISUAL AIDS IN EDUCATION.—The aims and psychological bases of audio-visual materials in the classroom. Attention to such materials as charts, filmstrips, flat pictures, maps, models, motion pictures, radio, records, slides, and television. 3 units.*

290. ADMINSTRATION OF SCHOOL PROPERTY.—Planning and management of the school plant and its equipment to meet instructional, health, and community needs for immediate and long-range purposes. This course is intended for teachers, principals, and superintendents. Areas to be treated will include site selection; trends in design, lighting, ventilation, and heating; custodial service and maintenance; and financing. 3 units.* PROFESSOR STUMPF

291. PUBLIC AND COMMUNITY RELATIONS OF SCHOOLS.—A study of the relationships between the entire school or school system and the several publics, especially to the community of a given school. Media for interpreting needs and views of the school to the public and vice-versa will be explored. The study applies to both public and private schools. 3 units. PROFESSOR STUMPF

FOR GRADUATES

315. SEMINAR IN SECONDARY-SCHOOL TEACHING.—Advanced-level consideration of principles, practices, and problems in secondary-school instruction. Designed particularly to accompany an internship. For students without previous internship credit, this course must be accompanied by Education 216. 3 units. PROFESSOR HURLBURT

323. PUBLIC SCHOOL FINANCE.—A study of educational costs, sources of revenue for the support of public education, collection of revenue, basis of distribution, and accounting for funds spent. 3 units.* PROFESSOR STUMPF

333. SEMINAR IN HIGHER EDUCATION.—An examination of current problems in American higher education, with special emphasis on case studies in organization, administration, and evaluation. For graduate students interested in the administration of higher education or college teaching with consent of the instructor. 3 units. PROFESSOR HOPKINS

335-336. SEMINAR IN SCHOOL ADMINISTRATION.—Organization and control over public education. During the first semester special attention is given to "external control" such as is exercised by various branches and levels of government and by professional and lay groups. "Internal control" as this relates to the principal, the teaching staff, and methods of classroom control, is considered in the second semester. 6 units each semester.

PROFESSORS BOLMEIER, HURLBURT, AND STUMPF; ASSOCIATE PROFESSOR PETTY

350, 351. DIRECTED ACTIVITIES IN SCHOOL ADMINISTRATION.—This course will satisfy, in part, requirements for the Superintendent's or Advanced Principal's Certificate. It involves work on an administrative project approved and

supervised by the instructor. Open only to school administrators. 3 units each semester.

PROFESSORS BOLMEIER, HURLBURT, AND STUMPF; ASSOCIATE PROFESSOR PETTY

354. SEMINAR IN SCHOOL LAW.—Open to students who have completed Education 253 or its equivalent and are working or plan to work on doctoral dissertations or masters' theses of a legal nature. Reports on research projects and recent court cases. 3 units.* PROFESSOR BOLMEIER

ENGINEERING

JAMES LATHROP MERIAM, PH.D., DEAN; CHARLES ROWE VAIL, PH.D., ASSOCIATE DEAN FOR GRADUATE STUDY AND RESEARCH—136 ENGINEERING

The College of Engineering offers programs of study and research leading to the degrees of Master of Science with a major in civil, electrical, or mechanical engineering and Doctor of Philosophy with a major in civil or electrical engineering. These programs are designed to provide a fundamental understanding of the science of engineering, which is based on mathematics and the physical sciences, as well as a basic understanding of the art of engineering, which depends on human imagination and judgment.

A *minimum* of 30 units of earned graduate credit beyond the Bachelor's degree is required for the M.S. degree: 12 in engineering, 6 in related minor work (normally mathematics or natural science). 6 in either the major or minor subject or in other areas approved by the major department and the Dean of the College of Engineering, and 6 for a research-based thesis. There is no language requirement for this degree.

A *minimum* of 60 units of earned graduate credit beyond the Bachelor's degree is required for the Ph.D. degree: 24 in engineering, 12 in related minor work (normally mathematics or natural science), 12 in either the major or minor subject or other areas approved by the major department and the Dean of the College of Engineering, and 12 for a research-based dissertation. In addition, a reading knowledge of two foreign languages which are relevant to the field of the dissertation is required (normally two of the following: French, German, or Russian).

CIVIL ENGINEERING

PROFESSOR BROWN, CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES—121 ENGINEERING; PROFESSORS BRYAN, MERIAM, AND VESIC; VISITING ASSOCIATE PROFESSOR KUMAR; ASSISTANT PROFESSORS BARTON, HARRAWOOD, HILL, AND WOOD

A student may specialize in one of the following fields of study for either the M.S. or the Ph.D. degree with a major in Civil Engineering; engineering mechanics, hydraulic engineering, materials science, sanitary engineering, soil and foundation engineering, or structural engineering. Appropriate combinations of these fields are also encouraged. Each graduate student participates in seminars appropriate to his field of study.

Under the Reciprocal Agreement with the Consolidated University of North Carolina, a student may include as a portion of the minimum requirements work offered by the Department of Environmental Sciences and Engineering of the University of North Carolina. Although minor work normally is taken in the natural sciences or mathematics, a student whose major interest relates to the social sciences may take relevant minor work in this area.

A minimum prerequisite to the graduate program in civil engineering is a basic knowledge of mathematics through linear differential equations, materials science, solid mechanics, and fluid mechanics.

CE 201. ADVANCED MECHANICS OF MATERIALS.—Analysis of structural elements described by ordinary differential equations, such as beams on an elastic foundation, curved beams, beam-columns, circular plates; introduction to plates and shells; energy principles and their use in structural analysis. 3 units.

ASSISTANT PROFESSOR HILL

CE 202. EXPERIMENTAL STRESS ANALYSIS.—The experimental analysis of

stress and strain in deformable bodies, correlation of theory with data from experiments; photoelasticity; strain gauges; dimensional analysis and similitude principles of models. 3 units. ASSISTANT PROFESSOR HILL

CE 205. APPLIED ELASTICITY.—Introduction to linear theory of elasticity; solutions of two-dimensional problems; three-dimensional problems of torsion and bending; stress concentrations; energy and variational principles with applications to design. 3 units. PROFESSOR MERIAM AND ASSISTANT PROFESSOR HILL

CE 211. MECHANICAL BEHAVIOR OF MATERIALS.—Macroscopic mechanical properties of materials for static, fatigue, dynamic and creep conditions; impact, shock, and stress wave properties; temperature, creep, viscoelastic and relaxation properties. 3 units. VISITING ASSOCIATE PROFESSOR KUMAR

CE 212. STRUCTURAL MATERIALS.—Elasticity and plasticity as related to rheology; natural and synthetic materials; reinforced materials; composites. 3 units. VISITING ASSOCIATE PROFESSOR KUMAR

CE 221. INCOMPRESSIBLE FLUID FLOW.—Steady and unsteady pipe flow, theories of turbulent flow; water hammer theory and control; surge tanks; air chambers; the analysis and control of fluid systems; effect of resistance; tapered conductors. 3 units. ASSISTANT PROFESSORS HARRAWOOD AND WOOD

CE 231. STRUCTURAL ENGINEERING.—The application of the fundamental theories of structural action to the design and analysis of structural members; specifications. 3 units. PROFESSOR BROWN

CE 232. REINFORCED CONCRETE DESIGN.—Design and analysis of reinforced concrete members including the influence of shrinkage and plastic flow; bond and diagonal tension; prestressed concrete members. 3 units. PROFESSOR BROWN

CE 235. FOUNDATION ENGINEERING.—An introduction to methods of analysis, design and construction of foundations. Bearing capacity and settlement of shallow and deep foundations. Soil exploration; excavation and bracing; drainage and stabilization; underpinning. Foundation vibrations. 3 units.
PROFESSOR VESIC

CE 243, 244. SANITARY ENGINEERING UNIT OPERATIONS AND PROCESS DESIGN.—Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and bio-treatment processes. 6 units. PROFESSOR BRYAN

CE 250. ENGINEERING ANALYSIS.—General concepts of the solutions of engineering problems with special emphasis on digital and analog computer and numerical methods; deflection and stability; torsion of noncircular beams and multicelled thin-walled structures; vibrations of beams and membranes; structures with both uniform and nonuniform properties and with rigid and nonrigid supports. 3 units. ASSISTANT PROFESSOR WOOD

CE 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydraulic engineering; materials science; structural engineering; or sanitary engineering. Master's credit only. 6 units. MEMBERS OF THE GRADUATE STAFF

CE 302. THEORY OF PLATES AND SHELLS.—Analysis of stresses and deformation of plates; vibrations of plates; membrane stress systems in shells; cylindrical shell analysis; bending stresses in shells. Prerequisite: CE 201, or CE 205, or equivalent. 3 units. ASSISTANT PROFESSOR HILL

CE 321. MECHANICS OF IDEAL FLUIDS.—Basic equations of ideal fluid flow; potential and stream functions; vortex dynamics; body forces due to flow fluids; methods of singularities in two-dimensional flows; analytical determination of potential functions; conformal transformations; free-streamline flows. Prerequisite: Mathematics 285, 286 or equivalent. 3 units.
ASSISTANT PROFESSORS HARRAWOOD AND WOOD

CE 322. MECHANICS OF VISCOUS FLUIDS.—Equations of motion of a viscous fluid; general properties and selected solutions of the Navier-Stokes equations; boundary layer equations with selected approximate solutions; laminar

boundary layers in axisymmetric and three-dimensional flows; unsteady laminar boundary layers. Prerequisite: Mathematics 285, 286. 3 units.

ASSISTANT PROFESSORS HARRAWOOD AND WOOD

CE 331, 332. ADVANCED STRUCTURAL DESIGN AND ANALYSIS.—Analytical and behavior concepts of structural components as related to the design of structural systems; classical methods; numerical and approximate techniques; behavior of structural elements under static and dynamic loading; buckling behavior. Prerequisite: CE 231 or equivalent. 6 units. ASSISTANT PROFESSOR BARTON

CE 335. MECHANICAL BEHAVIOR OF SOILS.—Origin of soils, soil minerals and processes of soil formation; physical chemistry of multiphase systems and soil structure. Elements of soil stabilization; permeability and flow of water through soils: capillary and osmotic phenomena; seepage problems; soil compressibility; theory of consolidation; sheer strength and failure criteria. Stress-strain relationships, volume changes and pore pressures during shear, strength properties. Advanced laboratory soil testing techniques. 4 units. PROFESSOR VESIC

CE 336. ADVANCED SOIL MECHANICS.—Theories of plastic and elastic equilibrium of soil masses and their application to analysis of problems such as: pressure on retaining walls, anchored bulkheads, cofferdams, silos, shafts, tunnels; stability of slopes and earth dams; stresses and settlement in soil masses and pavements, piles and pile groups subjected to lateral loads, elements of soil dynamics. Prerequisite: CE 335. 4 units. PROFESSOR VESIC

CE 365. ADVANCED TOPICS IN CIVIL ENGINEERING.—Opportunity for study of advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 units.

MEMBERS OF THE GRADUATE STAFF

ELECTRICAL ENGINEERING

PROFESSOR WILSON, CHAIRMAN—128 ENGINEERING; PROFESSOR OWEN, DIRECTOR OF GRADUATE STUDIES—108A ENGINEERING; PROFESSORS MEIER AND VAIL; ASSOCIATE PROFESSOR ARTLEY; ADJUNCT ASSOCIATE PROFESSOR BURGER; ASSISTANT PROFESSORS GEORGE AND PILKINGTON; VISITING LECTURER WELLS

A student may specialize in any one of the following fields in working toward either the M.S. or the Ph.D. degree with a major in Electrical Engineering: solid-state materials and devices; ferromagnetics; superconducting circuits; instrumentation; electronics; microwaves; computers and automatic control; energy conversion; and information processing. Graduate level physics courses in the area of microwaves may be used to satisfy either major or minor course requirements in electrical engineering.

A minimum prerequisite to the graduate courses in electrical engineering is a basic knowledge of differential equations, electric and magnetic field theory, and the theory of networks. A previous course in modern physics is recommended.

EE 201. ENERGY SYSTEMS.—Application of general energy concepts to specific engineering devices and systems; use of mathematical models to describe concepts of energy storage, transfer, transformation, and control that are applicable to electromagnetic, mechanical, fluid, and thermal systems; the Lagrangian, Hamiltonian formulation, and tensors. Prerequisite: permission of instructor. 3 units.

ASSOCIATE PROFESSOR ARTLEY

EE 203, 204. INFORMATION SYSTEMS.—General concepts of information storage, transfer, and processing: information theory, coding, noise theory, and response of information-handling systems in the time and frequency domains. Applications of information concepts to specific engineering situations: modulation, sampling, optimum filtering, detection in presence of noise, and comparisons of various systems. Prerequisite: permission of instructor. 6 units.

PROFESSOR OWEN AND ASSISTANT PROFESSOR GEORGE

EE 207. NETWORK SYNTHESIS.—Linear network theory, including a review of time and frequency domain analysis; network graphs; network functions and

realizability conditions; driving point impedance synthesis of passive networks; driving point and transfer specifications; approximation methods. Prerequisite: permission of instructor. 3 units. PROFESSORS OWEN AND VAIL

EE 211. SOLID-STATE THEORY.—The fundamental theory of wave motion in solids, including wave mechanics; variational method; perturbation theory; many-electron problems; one-electron approximation; free-electron approximation; electron spin; Brillouin zones; time-dependent Schrodinger's equation; and transition probabilities. Introduction to the thermodynamics of solids, including Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; ensembles; entropy; and free-energy functions. Prerequisite: permission of instructor. 3 units.

PROFESSOR VAIL, ASSOCIATE PROFESSOR ARTLEY, ADJUNCT ASSOCIATE PROFESSOR BURGER, AND ASSISTANT PROFESSOR PILKINGTON

EE 212. SOLID-STATE MATERIALS.—Concepts of solid state physics as applied to engineering materials: electrical, magnetic, thermal, and mechanical properties of solids; dialectrics; ferroelectrics; semiconductors; magnetic materials; and superconductors. Prerequisite: EE 211. 3 units.

PROFESSOR VAIL, ASSOCIATE PROFESSOR ARTLEY, ADJUNCT ASSOCIATE PROFESSOR BURGER, AND ASSISTANT PROFESSOR PILKINGTON

EE 213. MAGNETICS.—A study of ferromagnetic and ferrimagnetic materials, including effects of thermal conditions and treatment, mechanical stress, magnetic field intensity, crystal structure, and macroscopic geometry. Study emphasizes relationships of fundamental concepts of engineering interest. Prerequisite: EE 211 or equivalent. 3 units.* PROFESSOR WILSON AND ASSOCIATE PROFESSOR ARTLEY

EE 222. NONLINEAR ANALYSIS.—Introduction to methods of analyzing engineering systems described by nonlinear differential equations; analytic, numerical, graphical, and series approximation methods; analysis of singular points; stability of nonlinear systems. Application of various methods, such as the modified Euler, Runge-Kutta, isoclines, perturbation, revision, variation of parameters, residuals, harmonic balance, Bendixon, and Liapounov to phenomena of nonlinear resonance, subharmonics, relaxation oscillations, and forced oscillating systems. Prerequisite: permission of instructor. 3 units. PROFESSOR WILSON

EE 231. NUCLEAR ENGINEERING.—Review of nuclear physics; fission and the chain reaction; nuclear reactor principles; materials, instrumentation, and control of nuclear reactors; selected applications and techniques of nuclear engineering. Prerequisite: permission of instructor. 3 units.* PROFESSOR MEIER

EE 241. FEEDBACK CONTROL SYSTEMS.—Analysis and design of linear sampled-data systems; linear systems subjected to random inputs; analytical design using mean square error and integral error criteria; nonstationary and nonlinear systems. Prerequisite: permission of instructor. 3 units.

PROFESSOR WILSON AND VISITING LECTURER WELLS

EE 259. ADVANCED ELECTRIC ENERGY CONVERSION.—Equations of motion of electromechanical systems; fields and lumped parameters; state function concepts; mathematical techniques for analyzing electromechanical devices and systems; transducers; unified treatment employing matrix, tensor, and block-diagram concepts to obtain response under static and dynamic conditions; the generalized rotating machine. Prerequisite: permission of instructors. 3 units.*

PROFESSORS MEIER AND WILSON

EE 265. ADVANCED TOPICS IN ELECTRICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within the electrical engineering department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 units.* MEMBERS OF THE GRADUATE STAFF

EE 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under direction of a member of the staff in one of the following fields: solid-state materials and devices, ferromagnetics, superconducting circuits, instrumentation, electronics, microwaves, computers and automatic control, and information processing. Master's thesis credit only. 6 units.

MEMBERS OF THE GRADUATE STAFF

EE 311. QUANTUM THEORY IN THE ENGINEERING OF MATERIALS.—Concepts of the quantum theory of solids as applied to the molecular design of engineering materials. Topics selected will vary somewhat with the interests of the class, but the importance of quantized fields in crystals (phonons, magnons, plasmons, excitons, and polarons) and the interaction of these fields will be stressed. Prerequisites: EE 212 and Physics 316. 3 units. ASSISTANT PROFESSOR PILKINGTON

EE 315, 316. SOLID-STATE DEVICES.—Study of terminal parameters and functional characteristics of electronic devices in terms of the properties and structural configurations of their constituent materials. First semester emphasis on such semiconductor devices as transistors and on integrated semiconductor circuits; second semester emphasis on other types of solid-state devices. Prerequisite: permission of instructor. 6 units.* ADJUNCT ASSOCIATE PROFESSOR BURGER AND ASSISTANT PROFESSOR PILKINGTON

EE 321. NONLINEAR ELECTROMAGNETICS.—Mathematical description of nonlinear magnetic and semiconductor characteristics; transient and steady-state analysis and synthesis of nonlinear systems with application to such topics as magnetic amplifiers, frequency converters, oscillators, computer logic, and switching devices. Prerequisite: permission of instructor. 3 units. PROFESSOR WILSON

EE 342. OPTIMUM CONTROL SYSTEMS.—Use of variational methods in control system design; classical calculus of variations; dynamic programming; Pontriagin's maximum principle; computer applications in control. Prerequisite: permission of instructor. 3 units.

EE 343. NONLINEAR CONTROL SYSTEMS.—Analysis and design of nonlinear feedback control systems; approximations for small and large disturbances; phase-plane analysis; describing-function techniques; relay servomechanisms, optimum and quasi-optimum performance; nonlinear compensation. Prerequisite: permission of instructor. 3 units. PROFESSOR WILSON AND VISITING LECTURER WELLS

MECHANICAL ENGINEERING

PROFESSOR KENYON, ACTING CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES—142A ENGINEERING; PROFESSORS MACDUFF AND MERIAM; ASSOCIATE PROFESSORS BOYLE, ELSEVIER, AND PEARSALL; ASSISTANT PROFESSORS BUZZARD AND HARMAN

Specialization in the following areas of study is available to students seeking the M.S. degree with a major in Mechanical Engineering: materials science; compressible and incompressible fluids; engineering mechanics; vibrations; heat transfer; and instrumentation. Emphasis is placed on the application of the fundamental concepts of basic science and engineering science to mechanical design and analysis.

A minimum prerequisite to the graduate courses in mechanical engineering is a basic knowledge of differential equations, undergraduate thermodynamic theory, mechanics, and machine design.

ME 201. THEORETICAL AND APPLIED MECHANICS.—Introduction to the theory of elasticity, vibration analysis, and hydrodynamics. 3 units. PROFESSORS MACDUFF AND MERIAM

ME 202. THEORETICAL THERMODYNAMICS.—Classical and modern concepts of the conversion of heat and work; the combined First and Second Law; thermo-electricity; super-critical pressure systems; reheat and regenerative processes; binary-vapor systems; introduction to unsteady systems. 3 units. ASSOCIATE PROFESSOR ELSEVIER AND ASSISTANT PROFESSOR HARMAN

ME 221. ANALYSIS OF INCOMPRESSIBLE AND COMPRESSIBLE FLUID FLOW.—Flow of incompressible and compressible fluids; analysis of subsonic, transonic, supersonic, and hypersonic flow of fluids; potential flow, turbulence, experimental methods. 3 units.* ASSISTANT PROFESSOR HARMAN

ME 222. ANALYSIS OF HEAT TRANSFER.—Heat transfer by conduction, convection, and radiation; lumped and distributed heat capacity, resistance, losses; steady and transient flow. 3 units.* PROFESSOR KENYON

ME 231-232. SYSTEMS ENGINEERING.—Methods of obtaining parameters for

strength, response, and stability studies of mechanical systems; impedance and operational means of analysis: mechanical and electronic analogs; nonlinear theories. 6 units. PROFESSOR MACDUFF

ME 265. ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisites: Approval of the Director of Graduate Studies and the instructor under whom work will be done. 1 to 3 units. MEMBERS OF THE GRADUATE STAFF

ME 280. NUCLEAR REACTOR POWER CYCLES.—Introduction to basic reactor principles and reactor types; consideration of thermodynamic cycles for nuclear reactors for stationary and mobile plants; analysis of fluid flow and heat transfer problems unique to reactors with development of methods of reactor safety techniques; metallurgical problems peculiar to reactor design. 3 units.* PROFESSOR KENYON

ME 297, 298. THESIS RESEARCH.—A student with proper background may carry on research under the direction of the staff in one of the following fields: systems engineering, thermodynamics; heat transfer; and fluid flow. Thesis credit only. 6 units. MEMBERS OF THE GRADUATE STAFF

ENGLISH

PROFESSOR STEVENSON, CHAIRMAN—323 ALLEN BUILDING; PROFESSOR NYGARD, DIRECTOR OF GRADUATE STUDIES—321 ALLEN BUILDING; PROFESSORS BOYCE, DUFFEY, GOHDES, LIEVSAY, LUMIANSKY, SANDERS, TURNER, AND WARD; ASSOCIATE PROFESSORS BUDD, FERGUSON, HENINGER, SMITH, AND WILLIAMS

The department offers graduate work leading to the A.M., M.A.T., and Ph.D. degrees. A statement of the requirements for the Ph.D. degree may be obtained from the Director of Graduate Studies.

FOR SENIORS AND GRADUATES

203. CHAUCER.—Reading and interpretation of the minor poems, *Troilus*, and *The Canterbury Tales*. 3 units. PROFESSORS LUMIANSKY AND NYGARD

207. OLD ENGLISH GRAMMAR AND READINGS.—3 units. PROFESSORS LUMIANSKY AND NYGARD

208. HISTORY OF THE ENGLISH LANGUAGE.—A survey of the language from Old to Present English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 3 units. PROFESSORS LUMIANSKY AND NYGARD

209. PRESENT-DAY ENGLISH.—A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; semantic change; the relation of the written to the spoken language; usage. 3 units. PROFESSOR NYGARD

213. INTRODUCTION TO FOLKLORE.—A survey of the materials of popular tradition, the folksong, the folktale, the proverb, the riddle, and other forms; the methods of folklore investigation; and the relation of these popular genres to literary tradition. 3 units. (Not 1965-66) PROFESSOR NYGARD

215, 216. ELIZABETHAN DRAMA.—6 units. PROFESSOR LIEVSAY

217. MILTON.—Milton's poetry and prose, with emphasis on the major poems. 3 units. (Not 1965-66) PROFESSOR LIEVSAY

218. SPENSER.—A study of his works. 3 units. ASSOCIATE PROFESSOR HENINGER

219, 220. THE EIGHTEENTH CENTURY.—Swift, Pope, Defoe, Addison, Steele, and others are studied in the first semester; in the second, Gray, Johnson, Boswell, Collins, Goldsmith, the novelist, and other writers. 6 units. PROFESSOR BOYCE, ASSOCIATE PROFESSOR FERGUSON

221, 222. ENGLISH LITERATURE OF THE EARLY NINETEENTH CEN-

TURY.—Wordsworth, Coleridge, Scott, Byron, Shelley, Keats, Lamb, Hazlitt, and other writers. 6 units. PROFESSORS SANDERS, STEVENSON

223, 224. ENGLISH LITERATURE OF THE LATER NINETEENTH CENTURY.—The first semester is devoted chiefly to Carlyle, Dickens, Thackeray, Tennyson and Browning; the second semester to Arnold, Ruskin, Pater, George Eliot, Meredith, the Pre-Raphaelites, and Swinburne. 6 units.
PROFESSORS SANDERS, STEVENSON

227. LITERARY CRITICISM.—A study of the Greek and Roman critics, in chronological order but with emphasis on their permanent value rather than on the mere history; also of the Continental and English critics to about 1700. 3 units. (Not 1965-66) PROFESSOR LIEVSAY

229, 230. AMERICAN LITERATURE, 1800-1865.—The writers emphasized in the first semester are Emerson, Thoreau, and Hawthorne; in the second semester, Poe and Melville. 6 units. PROFESSOR TURNER, ASSOCIATE PROFESSOR BUDD

233, 234. AMERICAN LITERATURE, 1865-1920.—Selected works of representative authors of the period. The first semester will include Whitman, Lanier, Mark Twain, James, Howells, Emily Dickinson, Henry Adams, and the Local Colorists; the second semester, Crane, Norris, Moody, London, Dreiser, Edith Wharton, Willa Cather, O'Neill, Robinson, and Frost. The lectures will deal primarily with literary trends as shaped by the social background. 6 units. PROFESSOR GOHDES

235, 236. AMERICAN LITERATURE SINCE 1920.—First semester, selected fiction from Sherwood Anderson to the present and the Imagist movement in poetry. Second semester, later poetry and consideration of recent drama. 6 units.
PROFESSOR DUFFEY

237. ENGLISH DRAMA, 1642-1800.—The heroic play and the comedy of manners of the Restoration; the important plays, serious and comic, of the eighteenth century. 3 units. PROFESSOR WARD

239. SHAKESPEARE.—The plays and poems. 3 units.
ASSOCIATE PROFESSOR WILLIAMS

244. LITERARY BIOGRAPHY.—Reading and discussion of works by Plutarch, Roper, Walton, Aubrey, Mason, Johnson, Boswell, Lockhart, Carlyle, Froude, Gosse, and Strachey; the development of the literary form, its various methods, various theories of its nature and purpose. 3 units. PROFESSOR SANDERS

251, 252. ENGLISH LITERATURE OF THE SEVENTEENTH CENTURY.—Major works in prose, poetry, and drama from 1600 to the death of Dryden. 6 units.
PROFESSOR WARD

261, 262. ENGLISH LITERATURE OF THE TWENTIETH CENTURY.—Representative work of leading writers from 1900 to 1950, in fiction, drama, and poetry. The first semester will include Shaw, Conrad, Yeats, Wells, Bennett, Galsworthy, Ford, Synge, Forster, and Lawrence; the second semester, Joyce, Woolf, Edith Sitwell, Eliot, Huxley, Graves, Bowen, Auden, and Dylan Thomas. Critical analysis of selected texts, with discussion of techniques and ideas. 6 units.
ASSOCIATE PROFESSOR SMITH

264. MAJOR DEVELOPMENTS IN CONTEMPORARY AMERICAN POETRY.—The principal contributions to modern poetry made by American poets, including imagism and the new poetry; Eliot, Stevens, Crane, the "Fugitives," and a selection from the poets of the present generation. 3 units.

266. RECENT CRITICAL THOUGHT.—Questions of the nature and value of literature as reflected in recent criticism, theoretical and practical. 3 units.
PROFESSOR DUFFEY

269, 270. SOUTHERN LITERATURE.—The principal authors and the chief literary development from the beginning to the present. Emphasis in the first semester is on Byrd, Kennedy, Simms, Poe, Timrod, and the humorists; in the second on Lanier, Harris, Cable, Mark Twain, Ellen Glasgow, and Faulkner. Attention is given to the historical and cultural background and to literary relations extending outside the region. 6 units. PROFESSORS TURNER

277. ENGLISH PROSE OF THE SIXTEENTH CENTURY.—Readings in the major forms and authors. 3 units. PROFESSOR LIEVSAY

278. ENGLISH NON-DRAMATIC POETRY OF THE SIXTEENTH CENTURY.—Extensive select readings from representative types and authors, excluding Spenser. 3 units. PROFESSOR LIEVSAY, ASSOCIATE PROFESSOR HENINGER

FOR GRADUATES

304. STUDIES IN THE METAPHYSICAL POETS.—A careful study of Donne, Herbert, and Vaughan against the seventeenth-century background, with some attention to their influence on other writers in the period and their impact on twentieth-century poetry. 3 units. PROFESSOR LIEVSAY

306. STUDIES IN CHAUCER.—Cultural background, sources, themes, structures; special attention to *Troilus* and the dream-vision poems. 3 units. PROFESSORS LUMIANSKY AND NYGARD

311. BEOWULF.—Reading and interpretation of the text. 3 units. PROFESSORS LUMIANSKY AND NYGARD

313. THE TRADITIONAL BALLAD AND FOLKSONG.—A survey of English, Scottish, and American popular poetry, with attention to the textual and musical traditions. (No technical knowledge of music is required.) 3 units. PROFESSOR NYGARD

315. MIDDLE ENGLISH LITERATURE.—The literature of England from 1100 to 1500 (excluding Chaucer); a study of medieval genres with a close reading of selected major works. 3 units. PROFESSORS LUMIANSKY AND NYGARD

320. MEDIEVAL ROMANCES.—Origins, types, forms, themes; special attention to Arthurian materials. 3 units. (Not 1965-66) PROFESSOR LUMIANSKY

322. GENRE STUDIES IN TWENTIETH-CENTURY AMERICAN LITERATURE.—Formal and thematic problems posed by the fiction, poetry or drama of this century. 3 units. PROFESSORS DUFFEY AND GOHDES

330. TEXTUAL CRITICISM.—The principles of analytical bibliography and their application to problems and procedures in the study of Elizabethan printed books. 3 units. ASSOCIATE PROFESSOR WILLIAMS

331. EMERSON.—A study of Emerson's ideas as reflected in selected examples of his essays and poems. 3 units. PROFESSOR GOHDES

332. WHITMAN.—A detailed study of *Leaves of Grass* and of selected prose works. 3 units. (Not 1965-66) PROFESSOR GOHDES

333. HAWTHORNE AND MELVILLE.—Extensive reading in the works of Hawthorne and Melville, and close study of selected writings. 3 units. PROFESSOR TURNER

334. STUDIES IN THE CRITICAL AND PHILOSOPHICAL IDEAS OF COLERIDGE AND CARLYLE.—3 units. PROFESSOR SANDERS

338. STUDIES IN AMERICAN REALISTIC FICTION.—Intensive study of a post-Civil War novelist such as Howells, with lesser attention to a representative precursor such as De Forest, and a twentieth century writer such as Dreiser. 3 units.

339. STUDIES IN SHAKESPEARE.—Intensive study of carefully limited topics, together with critical analysis and interpretation of selected texts. 3 units.

340. STUDIES IN RENAISSANCE ENGLISH PROSE.—Close readings in various forms and authors as they reflect the culture and thought of the Renaissance. 3 units. (Not 1965-66) PROFESSOR LIEVSAY

342. STUDIES IN DRYDEN AND HIS AGE.—The early poems, the important odes, the religious and political poems, selected critical and controversial prose, the heroic play and tragedy. 3 units. PROFESSOR WARD

345. THE EIGHTEENTH-CENTURY NOVEL.—Richardson, Fielding, Smollett, and Sterne are emphasized. Attention is given to earlier prose fiction and to other contributing literary patterns. 3 units. (Not 1965-66) PROFESSOR BOYCE

346. STUDIES IN SWIFT.—Intensive study of the major prose; selected readings in the verse, political writings, and miscellaneous prose. 3 units.
ASSOCIATE PROFESSOR FERGUSON

347. STUDIES IN VICTORIAN POETRY.—Analysis of themes, forms, and sources in the works of Tennyson, Browning, Arnold, Rossetti, Swinburne, Meredith, Hardy, and Hopkins. 3 units. PROFESSOR STEVENSON

348. STUDIES IN VICTORIAN FICTION.—Techniques and principal types of material in the novels of Dickens, Thackeray, Trollope, Eliot, Meredith, and Hardy. 3 units. PROFESSOR STEVENSON

363. STUDIES IN BRITISH POETRY OF THE TWENTIETH CENTURY.—Detailed examination of major poetic texts, with background readings in prose. 3 units. ASSOCIATE PROFESSOR SMITH

374. STUDIES IN AMERICAN HUMOR.—The native tradition in the Down-East humorists and the humorists of the Old Southwest, in Mark Twain and his contemporaries, and afterward. 3 units. PROFESSOR TURNER

378. SAMUEL JOHNSON'S LITERARY CRITICISM AND RELATED TOPICS. —3 units. PROFESSOR BOYCE

ENGLISH FOR FOREIGN STUDENTS.—A non-credit semester course in English for foreign students. Restricted to registered undergraduate and graduate foreign students and, to capacity, to employees and wives of foreign students. Without fee for registered students who are permitted an audit without fee; otherwise a $5.00 fee.

FORESTRY

PROFESSOR HARRAR, CHAIRMAN, 213 BIOLOGICAL SCIENCES BUILDING; PROFESSOR YOHO, DIRECTOR OF GRADUATE STUDIES, 104 BIOLOGICAL SCIENCES BUILDING; PROFESSORS ANDERSON, KRAMER, NAYLOR, OSBORNE, AND RALSTON; ASSOCIATE PROFESSORS JOHNSON AND WOODS; ASSISTANT PROFESSORS KNOERR, STAMBAUGH, AND SULLIVAN

Major and minor work is offered in the scientific aspects of forestry leading to the Master of Arts and Doctor of Philosophy degrees. Work for these degrees may be pursued in forest-tree physiology, wood anatomy and properties, forest pathology, silvics, forest soils, forest mensuration and biometry, forest entomology, forest economics, and forest climatology and hydrology. College graduates who have had specialized training in botany or soil science and in allied basic subjects, such as physics, chemistry, geology, and zoology, may pursue graduate study and research only in the specialized fields for which their previous work has qualified them. For information on professional training in forestry, see *Bulletin* of the School of Forestry. For detailed information concerning admission to the Graduate School and for regulations governing candidacy for the A.M. and Ph.D. degrees and for other regulations, consult the proper pages in this *Bulletin*.

FOR SENIORS AND GRADUATES

223. FOREST PATHOLOGY.—Infectious and non-infectious diseases of forest trees, and related deterioration of forest products. Field and laboratory study of symptoms, etiology, and control. Prerequisites: Botany 1 and 2, or equivalent. 3 units. ASSISTANT PROFESSOR STAMBAUGH

230. FOREST ENTOMOLOGY.—Morphology, general classification, life histories, and control of insects injurious to forest trees, logs, and lumber. 3 units.
PROFESSOR ANDERSON

243. SILVICS.—Ecological foundations of silviculture with special reference to forest site factors; influence of forests on their environment; growth and development of trees and stands; origin, development, and classification of forest communities; methods of studying forest environments. Desirable prerequisite: plant physiology, plant ecology, and Forestry 261, or equivalent. 3 units. (Summer only)
ASSOCIATE PROFESSOR WOODS

251. SAMPLING METHODS IN FORESTRY.—Statistical background for solution of sampling problems with special references to sampling of forest and associated populations. Prerequisite: Forestry 151. 3 units.* PROFESSOR OSBORNE

257. DESIGN OF FORESTRY EXPERIMENTS AND ANALYSIS OF DATA.—Role of experimental design in field and laboratory, and statistical analysis of data as aspects of scientific method in forest research. 5 units.* PROFESSOR OSBORNE

261. FOREST SOILS.—Origin, development, and classification of soils with special emphasis on those developed in humid climates; morphological, physical, and chemical properties of soils in relation to growth of trees; effect of forests on soils. Prerequisites: Chemistry 1 and 2, and Physics 1, or equivalents; physical geology, mineralogy, petrology, and analytical chemistry are also desirable. 3 units.
PROFESSOR RALSTON

270. ECONOMICS OF FORESTRY.—Development of the principles of economics useful in the analysis of the past, present, and prospective supply and demand situations for forestry goods and services; problems of the economics of the firm and industry, basic and peculiar to forestry, with special attention to the time dimensions of value; the role of forestry in the general economy including attention to relevant institutional factors. Prerequisite: at least one course in the principles of economics. 3 units. PROFESSOR YOHO

276. FORESTRY POLICY.—Objective study and analysis of the development of public land and forestry policies in the United States, present policies of public and private forestry organizations, and current policy issues in the light of economic and other criteria. 2 units. PROFESSOR YOHO

290. WOOD ANATOMY.—Study of the physical features and the gross and minute structural characteristics of wood leading to the identification of the commercial woods of the United States, and the important tropical woods used in American wood-working industries. Elementary microtechnique. Prerequisites: one year of biology, Forestry 241 or equivalent. 3 units.
ASSISTANT PROFESSOR SULLIVAN

295. SURFACE GENERATION IN WOOD.—Directed energy systems; physics of edges; details of wood surface generation machinery; surface generation in relation to wood anatomy; physical measurement of wood surfaces. Prerequisites: For. 290 or equivalent, calculus. 2 units. ASSISTANT PROFESSOR SULLIVAN

296. CHEMISTRY OF WOOD.—Nuclear, atomic and molecular force systems; chemical composition and distribution of chemical components in wood; interaction of wood and moisture; macro-chemical reactions of wood and other cellulosic systems including degradation reactions. Prerequisites: Forestry 290 or equivalent, calculus, organic chemistry. 3 units. ASSISTANT PROFESSOR SULLIVAN

297. WOOD PHYSICS (MECHANICS).—A study of the reaction of wood to mechanical forces; the derivation of working properties and their variance; experimental and standard testing procedures; introduction to theories of elasticity and plasticity; theories of failure; anatomical and moisture effects. Prerequisites: Forestry 290 or equivalent, calculus, college physics, statistics. 3 units.
ASSISTANT PROFESSOR SULLIVAN

FOR GRADUATES

301, 302. ADVANCED STUDIES IN FORESTRY.—To meet individual needs of graduate students in the following branches of forestry: (a) Silvics, (b) Forest Soils, (c) Forest Economics, (f) Properties of Wood, (g) Forest Mensuration and Biometry, (h) Forest Entomology, (k) Forest-tree Physiology, (l) Forest Pathology, (m) Forest Climatology and Hydrology.
ALL MEMBERS OF THE GRADUATE SCHOOL STAFF

321. RESEARCH TECHNIQUES IN FOREST PATHOLOGY.—Fundamental phytopathological methods employed in field and laboratory investigations of tree disease pathogens. Literature review and discussion of current developments. Prerequisite: Forestry 223 or equivalent. 3 units. ASSISTANT PROFESSOR STAMBAUGH

331. TOXICOLOGY OF INSECTICIDES.—Study of the physical, chemical, and biological properties of materials used to destroy insects. Formulation, toxicology

and insect physiology as related to insecticide action are emphasized. Prerequisites: one course in entomology; organic chemistry is recommended. 3 units.
PROFESSOR ANDERSON

332. ECOLOGY OF FOREST INSECTS.—Study of the environmental factors as they influence insect population development. Both the physical and the biotic aspects are considered on the basis of field and laboratory experimental methods. Prerequisite: Forestry 230 or equivalent. 3 units. PROFESSOR ANDERSON

333. MORPHOLOGY AND TAXONOMY OF FOREST INSECTS.—Principles of insect structure, classification and nomenclature; laboratory work concentrated on the collection, preservation and identification of both the adult and immature stages of various forest insects. Prerequisite: Forestry 230 or equivalent. 3 units.
PROFESSOR ANDERSON

341. FOREST METEOROLOGY.—The science of meteorology, including microclimatology, as it is related to forest biology and hydrology; emphasis is on physical laws governing exchange of heat and moisture in the climatic environment. Prerequisite: One year of college physics; calculus desirable. 3 units.
ASSISTANT PROFESSOR KNOERR

342. FOREST HYDROLOGY.—The influence of forests and other vegetation on local climate, the hydrolic cycle, and soil stability; relationships to water yield, floods, and erosion. Prerequisite: One year of college physics; calculus desirable. 3 units. ASSISTANT PROFESSOR KNOERR

344. MICROMETEOROLOGY.—Physics of the earth's surface environment with emphasis on plant and animal microclimates: budgets of mass, momentum and energy; vertical structure of wind, temperature, water vapor and carbon-dioxide in relation to exchange processes within the biosphere; local circulation and eddy diffusion; principles of micrometeorological measurement. Prerequisite: Forestry 341, calculus desirable. 3 units. ASSISTANT PROFESSOR KNOERR

347, 348. SEMINAR IN SILVICS.—Advanced topics in silvics are discussed and current research papers and reports are reviewed, analyzed, and evaluated. 2 units.
ASSOCIATE PROFESSOR WOODS

352. ANALYSIS OF FOREST MEASUREMENTS.—Empirical equations and curve-fitting appropriate to forestry data; functional relationships among experimental responses; useful mathematical models for forestry populations; selected non-parametric analysis methods. Prerequisite: Forestry 250 or Mathematics 233 or equivalents. 3 units. PROFESSOR OSBORNE

353. SAMPLING AND EXPERIMENTAL DESIGN IN FORESTRY.—Theory and application of selected sampling designs to forestry populations. Includes multistage and multi-phase designs; acceptance and sequential sampling; regression, ratio, and double sampling; sampling with variable probability of selection. Construction and analysis of designs for forestry experiments. Prerequisites: Forestry 250 or mathematics 233 or equivalents. 3 units. PROFESSOR OSBORNE

357, 358. RESEARCH IN FORESTRY.—Credits to be arranged. Students who have had adequate training may do research under direction of members of the faculty in the following branches of forestry.

a. SILVICS.—Prerequisites: Forestry 241, 243, and 244, or equivalents.
ASSOCIATE PROFESSOR WOODS

b. FOREST SOILS.—Prerequisite: Forestry 261 or equivalent.
PROFESSOR RALSTON

c. FOREST ECONOMICS.—Prerequisite: Forestry 270 or equivalent.
PROFESSOR YOHO

f. PROPERTIES OF WOOD.—Prerequisites: Forestry 259 and 260, or equivalents. PROFESSOR HARRAR AND ASSISTANT PROFESSOR SULLIVAN

g. FOREST MENSURATION AND BIOMETRY.—Prerequisites: Forestry 151, 251, and 252, or equivalents. PROFESSOR OSBORNE

h. FOREST ENTOMOLOGY.—Prerequisite: Forestry 230 or equivalent.
PROFESSOR ANDERSON

k. PHYSIOLOGY OF FOREST TREES.—Prerequisites: Plant physiology and plant ecology or silvics. PROFESSOR KRAMER

l. FOREST PATHOLOGY.—Prerequisites: Plant physiology and Forestry 223 or equivalent. ASSISTANT PROFESSOR STAMBAUGH

m. FOREST CLIMATOLOGY AND HYDROLOGY.—Prerequisite: Forestry 341, 342, or equivalents. ASSISTANT PROFESSOR KNOERR

362. FOREST SOIL PHYSICS.—Analysis of the physical properties of soil related to the growth and development of forest trees. Consideration is given to the significance of soil moisture, temperature, aeration, and structural characteristics in the analysis of forest growth relationships. Prerequisite: Forestry 261. 3 units. (Not 1964-65) PROFESSOR RALSTON

366. FOREST SOIL FERTILITY.—The relationships of soil fertility factors in the growth of forest trees. Emphasis is placed on the analysis of soil factors related to the mineral nutrition of trees. Prerequisites: Forestry 262 with analytical chemistry recommended. 3 units (1964-65) PROFESSOR RALSTON

368. FIELD SEMINARS.—Field studies, consultations, and visits to areas of interest during spring vacation period, or at other times, in the several branches of forestry listed under Forestry 301-302. Credits to be arranged. THE STAFF

378. SEMINAR IN FOREST ECONOMICS.—Examination and discussion of the application of economic concepts in forestry, the potential contribution of economic analysis to private and public forest management; current research in forest economics. Prerequisites: Forestry 270 and 379 or consent of the instructor; advanced courses in economics and economic theory are desirable. 2 units. PROFESSOR YOHO

379. ECONOMIC ANALYSIS IN FORESTRY.—Principles of economics of particular value to problems of resource allocation and efficiency in private forest management based on a static and dynamic firm theory approach, linear programming and activity analysis. Development of production principles applicable to forestry problems in use of land, labor, and capital; resource and production combinations; production location and timing; cost structure and asset control; uncertainty and expectations. Prerequisites: Forestry 270 or consent of instructor. 3 units. PROFESSOR YOHO

390. WOOD-LIQUID SURFACE INTERACTIONS.—Free surface energy of liquids and solids; theory of adhesion; adhesion for wood substrates; physical and chemical description of adhesives and adhesive joints; wood coatings; physical and chemical properties of surface coating materials. Prerequisites: Forestry 296. 3 units. ASSISTANT PROFESSOR SULLIVAN

391. SEMINAR IN WOOD SCIENCE AND FOREST PRODUCTS.—Application of scientific disciplines to product research and development; wood science in industry. 1 unit. PROFESSOR HARRAR, ASSISTANT PROFESSOR SULLIVAN

392. ADVANCED WOOD PHYSICS.—Theories of elasticity and plasticity; mechanical damping; piezoelectric properties; structure of crystals; fatigue failure. Prerequisites: Forestry 297, Forestry 296, Experimental Design. 3 units. ASSISTANT PROFESSOR SULLIVAN

GEOLOGY

PROFESSOR BERRY, CHAIRMAN, 019 SCIENCE BUILDING; ASSOCIATE PROFESSOR HERON, ACTING DIRECTOR OF GRADUATE STUDIES, 105 SCIENCE BUILDING; ASSISTANT PROFESSOR PILKEY

The Department of Geology offers graduate work leading to the A.M. degree. An undergraduate degree in geology is not a prerequisite for graduate studies, but a student must have had or must take introductory courses in mineralogy, sedimentary rocks, stratigraphy, paleontology, and structure. In addition he must have had one year of college chemistry, one year of college physics, and mathematics through calculus.

Graduate courses in the Department of Geology are designed to provide training in the field of environmental sedimentary geology with specialized training in bio-environments, litho-environments, or modern environments.

An acceptable thesis is required.

FOR SENIORS AND GRADUATES

203. ADVANCED STRATIGRAPHY.—A survey of the Phanerozoic deposits of the world with special emphasis on type areas. 3 units.

206. GEOLOGICAL OCEANOGRAPHY.—A broad survey of many geological aspects of the oceans including sediment types, processes of sedimentation, geological structures of the ocean basins, and bottom physiography. 3 units.
ASSISTANT PROFESSOR PILKEY

207. SEDIMENTARY PETROGRAPHY.—Systematic description and classification of sedimentary rocks. 3 units. ASSOCIATE PROFESSOR HERON

222. SEDIMENTARY MINERALS.—Major detrital and authigenic minerals with emphasis on the clay minerals. 3 units. ASSOCIATE PROFESSOR HERON

234. MARINE GEOLOGY.—Ocean-floor topography, sediment transport and deposition. 3 units. ASSISTANT PROFESSOR PILKEY

FOR GRADUATES

305. PHYSICAL ENVIRONMENTS SEMINAR.—3 units.
ASSISTANT PROFESSOR PILKEY

306. BIO-ENVIRONMENTS SEMINAR.—3 units.

371, 372. ADVANCED TOPICS IN GEOLOGY.—To meet the individual needs of graduate students for independent study in the various environmental sedimentary fields. 1 to 3 units. ALL MEMBERS OF THE GRADUATE STAFF

RELATED COURSES IN OTHER DEPARTMENTS

Courses comprising a candidate's minor may be selected from the fields of zoology, physics, mathematics, chemistry, or approved courses offered in the Department of Geology at the University of North Carolina at Chapel Hill.

GERMANIC LANGUAGES AND LITERATURE

PROFESSOR SALINGER, CHAIRMAN AND DIRECTOR OF GRADUATE STUDIES—106 OLD LAW; VISITING PROFESSOR JACKSON; ASSOCIATE PROFESSORS PHELPS, SEYMOUR AND WILLSON; ASSISTANT PROFESSOR DEINERT

The Department of Germanic Languages and Literature offers graduate work leading to the A.M. degree. Students who expect to major in German should have had sufficient undergraduate courses in Germanic languages to enable them to proceed to more advanced work.

Students who wish to take courses in German for a minor should normally have completed a third-year course (in exceptional cases, a second-year) of college German with acceptable grades.

201, 202. GOETHE.—A study of his life and works, in the light of his lasting significance to world literature. 6 units. (Not 1965-66) PROFESSOR SALINGER

203, 204. EIGHTEENTH CENTURY.—Eighteenth-century German literature in its relation to contemporary European philosophy. 6 units.*
ASSOCIATE PROFESSOR PHELPS

205 MIDDLE HIGH GERMAN.—The language and literature of Germany's first classical period. 3 units.* ASSOCIATE PROFESSOR SEYMOUR

206. MIDDLE HIGH GERMAN.—The Arthurian Romance in Germany. 3 units.
PROFESSOR JACKSON

207, 208. GERMAN ROMANTICISM.—The course covers the entire field of German Romanticism from 1800 to 1850. 6 units. (1965-66)
ASSOCIATE PROFESSOR WILLSON

209, 210. KLEIST, GRILLPARZER, AND HEBBEL.—The development of the drama in Germany and Austria between Schiller and naturalism. 6 units.*
PROFESSOR SALINGER AND ASSOCIATE PROFESSOR WILLSON

211, 212. HEINRICH HEINE.—A study of the German poet and his immediate successors in the movement known as *Jungdeutschland*. 6 units. (1965-66)
PROFESSOR SALINGER

213. NINETEENTH-CENTURY LITERATURE.—From the end of Romanticism through Realism. Readings from Mörike, Büchner, Hebbel, Stifter, Keller, Meyer, Storm, and Fontane. 3 units. (Not 1965-66) ASSISTANT PROFESSOR DEINERT

214. THE TWENTIETH CENTURY.—From Naturalism to the present, with emphasis on Hauptmann, Hofmannstal, George, Rilke, Mann, Kafka, Hesse, Broch, Musil, Brecht, and Benn. 3 units. (Not 1965-66) ASSISTANT PROFESSOR DEINERT

215 SEVENTEENTH-CENTURY LITERATURE.—A study of the leading writers of the Baroque, seen against the background of their time. 3 units. (1965-66) ASSISTANT PROFESSOR DEINERT

216. HISTORY OF THE GERMAN LANGUAGE.—The development of the phonology, morphology, and syntax of German from earliest beginnings to the present. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR SEYMOUR

218. THE TEACHING OF GERMAN.—Critical survey of modern teaching techniques; intensive practice in solving problems encountered in the teaching of German on the secondary and college levels. Analysis and evaluation of textbooks and related audio-visual materials with special emphasis on the utilization of the language laboratory. 3 units.* (1965-66) ASSOCIATE PROFESSOR PHELPS

—.GRADUATE READING COURSE. An intensive course in German to develop rapidly the ability to read German in several fields. Graduate students only. No credit. ASSOCIATE PROFESSOR SEYMOUR

RELATED COURSES IN OTHER DEPARTMENTS

The following courses in other departments are recommended to students who are majoring in Germanics, as particularly valuable in building a proper background for Germanic studies:

(a) Graduate courses in literature or philology, offered by the ancient and modern language departments, to be selected after consultation with the Germanic Department.

(b) Graduate courses in history and philosophy, offered by those departments, to be selected after consultation with the Germanic Department.

HISTORY

PROFESSOR WATSON, CHAIRMAN—235 ALLEN; PROFESSOR PARKER, DIRECTOR OF GRADUATE STUDIES—232 ALLEN; PROFESSORS ALDEN, COLTON, CRANE, CURTISS, FERGUSON, HAMILTON, HOLLEY, LANNING, MANCHESTER, ROGERS, ROPP, AND WOODY; ASSOCIATE PROFESSORS ACOMB, DAVIS, DURDEN, HOLLYDAY, SCOTT, VAN AKEN, AND YOUNG; ASSISTANT PROFESSORS GILLIN AND LERNER

A candidate for the degree of Doctor of Philosophy is required to prepare himself for examination in five fields, of which four shall normally be within history and of which one must be in American history or in the history of Western Europe. The choice and delimitation of fields is determined in consultation with his supervisor and the Director of Graduate Studies. The Department offers graduate instruction in Ancient History; Medieval Europe; Modern Europe; American History; England and the Commonwealth; Russia; Latin America; the Far East in the modern period; South Asia in the modern period; military history; and historiography.

Students may receive credit for either semester of a hyphenated course without taking the other semester if they obtain written permission from the instructor and the Director of Graduate Studies.

FOR SENIORS AND GRADUATES

201-202. THE HISTORY OF RUSSIA, 1801-1917.—The development of the Russian Empire in its political, social, and economic aspects, and the growth of forces leading to its downfall. 6 units. PROFESSOR CURTISS

203-204. THE UNITED STATES, 1850-1900.—The rise of sectionalism, secession, wartime problems of the Union and Confederacy, political and economic adjust-

ments of Reconstruction, the status of the Negro, the New South, problems of capital and labor, the agrarian revolt, political parties and reform. 6 units. (Not 1965-66) PROFESSOR WOODY

205-206. THE UNITED STATES IN THE TWENTIETH CENTURY.—The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administration. 6 units. PROFESSOR WATSON

209-210. CONSTITUTIONAL HISTORY OF THE UNITED STATES, 1760 TO THE PRESENT.—A study of the basic problems in forming the Constitution; of its development through the major crises in the history of the United States; of the effects of changing social, cultural, economic, and political conditions on the Constitution. 6 units. (Not 1965-66)

212. RECENT INTERPRETATIONS OF UNITED STATES HISTORY.—A course designed to encourage a critical evaluation of major issues in United States history through examination of recent interpretations of key problems. 3 units. PROFESSOR WATSON

213-214. THE OLD SOUTH.—Political thought and party trends from Jefferson to Calhoun; agriculture, slavery, expansion; commerce, manufacturing, transportation; urban life, religion, education; the rise of Southern nationalism. 6 units. PROFESSOR WOODY

215-216. THE DIPLOMATIC HISTORY OF THE UNITED STATES.—A study of the history of American diplomacy, with particular emphasis upon those factors, foreign and domestic, which have shaped the foreign policies of the Republic. 6 units. ASSOCIATE PROFESSOR DAVIS

217, 218. EUROPE SINCE 1870.—International relations since the Franco-German War is the chief subject of study in this course; special emphasis is placed upon the underlying economic and political influences. 6 units.

221-222. THE AGE OF THE RENAISSANCE.—The decline of characteristic features of medieval civilization and the rise of modern European institutions with particular attention to intellectual movements from Dante to Erasmus. 6 units.

223-224. THE OLD REGIME AND THE FRENCH REVOLUTION, 1661-1815.—A study of social, political, and intellectual revolutions in continental Europe, centering on France and giving special attention to successive interpretations of historical change. 6 units. ASSOCIATE PROFESSOR ACOMB

225. THE AGE OF THE REFORMATION.—History and thought of Christianity between 1517 and 1680. (Also listed as Religion 250.) 3 units. ASSOCIATE PROFESSOR HILLERBRAND

227, 228. EUROPE IN THE NINETEENTH CENTURY.—A study, beginning with the career of Napoleon Bonaparte, of the forces and personalities influential in the nineteenth century. Emphasis in the first semester is on the problems of the biographer; in the second, on those of a student of national communities. 6 units. (Not 1965-66) PROFESSOR PARKER

229. RECENT INTERPRETATIONS OF MODERN EUROPEAN HISTORY.—A course designed to develop the ability to appraise critical historical issues through the study and discussion of recent interpretations of key historical problems in modern European history. 3 units. PROFESSOR PARKER

231-232. THE HISPANIC COLONIES AND REPUBLICS IN AMERICA.—6 units. PROFESSOR LANNING

233-234. THE INSTITUTIONAL, CULTURAL, AND SOCIAL HISTORY OF HISPANIC AMERICA.—The first semester deals with the culture, society, and institutions of the Spanish colonies in America, and the second semester with those of the Hispanic American Republics. 6 units. (Not 1965-66) PROFESSOR LANNING

235, 236.—EUROPEAN EXPANSION OVERSEAS.—In the first semester attention is given to the age of discovery, and to the origin and the development of the great

European overseas empires with special emphasis on the role of the Portuguese in India and the Americas. The work of the second semester deals with the decline of the mercantile empires, the emergence of independent centers of European culture overseas (Brazil being taken as an example), and the revival of mercantile imperialism in the late nineteenth and twentieth centuries. 6 units.

PROFESSOR MANCHESTER

237-238. EUROPE IN THE MIDDLE AGES, 395-1500.—Attention is given both to distinctive attributes of the period, such as feudalism and scholastic learning, and to such formative elements of European civilization as nationalism and the universities. 6 units. ASSOCIATE PROFESSOR YOUNG

241-242. NATIONALISM AND COMMUNISM IN THE FAR EAST.—The growth of nationalism in China and Japan, culminating in Japan's invasion of China and the subsequent rise to power of the Chinese Communists. 6 units.

ASSISTANT PROFESSOR GILLIN

245-246. WAR IN THE MODERN WORLD.—This course is concerned with the relations between warfare and modern political, economic and social conditions. Special attention is given to the development of British and American military methods and to the events of the American Civil War and the two World Wars. The work in the first semester deals with Clausewitz's theories of warfare and the period from the introduction of gunpowder to 1871; in the second semester there is a more detailed analysis of recent land, sea, and air warfare. 6 units.

PROFESSOR ROPP

247. THE HISTORY OF MODERN INDIA, 1757-1857.—Historiography of the period; the western impact on the sub-continent; the expansion of Company power; the background and nature of the Indian Mutiny; problems in historical analysis and interpretation. 3 units. PROFESSOR CRANE

248. THE HISTORY OF MODERN INDIA AND PAKISTAN, 1857-1947.—Historiography of the period; Crown rule; social change; modernization and the economy of the sub-continent; development of nationalism; the Gandhian era and Muslim separatism; the transfer of power and partition; problems of independence. 3 units. PROFESSOR CRANE

249-250. SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES.—Evolution of American society and thought to the present; lectures and class discussions seek to illuminate the interplay of ideas and social practice by the examination of attitudes and institutions in such fields as science and technology, law, learning, and religion. 6 units. PROFESSOR HOLLEY

251-252. RECENT EUROPEAN HISTORY.—A history of the political and economic developments in Europe since 1870. 6 units. PROFESSOR COLTON

257. SOCIAL AND CULTURAL HISTORY OF THE HELLENISTIC WORLD FROM ALEXANDER TO AUGUSTUS.—Lectures, readings, and discussions. This course will not be separately credited without the sequel, 258. 3 units.

PROFESSOR ROGERS

258. SOCIAL AND CULTURAL HISTORY OF THE GRAECO-ROMAN WORLD.—The Roman Empire as the trustee of Hellenism and Christianity, and its own original contributions to modern civilization; lectures, readings, and discussions. This course continues 257 and will not be separately credited. 3 units.

PROFESSOR ROGERS

259-260. THE EMERGENCE OF THE NEW SOUTH, 1865 TO THE PRESENT.—Reconstruction, industrialization, and agrarian revolt; changing status of the Negro; the South's role in the reform movements headed by Theodore Roosevelt, Woodrow Wilson, and Franklin D. Roosevelt. 6 units.

ASSOCIATE PROFESSOR DURDEN

261-262. RUSSIA IN THE TWENTIETH CENTURY.—A study of the background of the Revolution of 1917 followed by an analysis of the history and policies of the Soviet state. 6 units. ASSISTANT PROFESSOR LERNER

263-264. AMERICAN COLONIAL HISTORY AND THE REVOLUTION, 1607-

1789.—The founding and institutional development of the English colonies: the background, progress, and results of the Revolution. 6 units. PROFESSOR ALDEN

265-266. MODERN SOUTH AMERICA.—Political, social, and economic history of leading South American nations from the mid-nineteenth century to the present. 6 units. ASSOCIATE PROFESSOR VAN AKEN

267, 268. FROM MEDIEVAL TO EARLY MODERN ENGLAND.—The intellectual, social, and political problems of transition to modern England, with special emphasis on the English Renaissance. 6 units. PROFESSOR FERGUSON

269. BRITISH HISTORY FROM 1714 TO 1867.—The interrelationship of the leadership of such men as Walpole, Chatham, Pitt, and Peel with war, revolution, and social institutions; the rise of the cabinet system; the Industrial Revolution; imperial changes; and reform. 3 units. PROFESSOR HAMILTON

270. GREAT BRITAIN AND THE COMMONWEALTH OF NATIONS, 1867 TO THE PRESENT.—A history of Great Britain at the height of her world dominance and beyond, her oceanic empire, and the evolution of that empire into a unique world-wide Commonwealth of Nations. 3 units. PROFESSOR HAMILTON

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the main sources and traditions of the classical civilization of the Indian subcontinent with particular attention to religious movements and institutions. (Also listed as Religion 285.) 3 units. ASSISTANT PROFESSOR SULLIVAN

297. THE BRITISH EMPIRE IN THE NINETEENTH CENTURY (From 1783).—3 units.

298. THE COMMONWEALTH IN THE TWENTIETH CENTURY.—3 units.

FOR GRADUATES

303-304. THE UNITED STATES IN THE TWENTIETH CENTURY.—The emergence of the United States as a major power; attention is focused on domestic developments and conflicting theories of expansion and federal power. Emphasis in the first semester is on the progressive era and the first World War; the second semester is devoted to the twenties and to the Franklin Roosevelt administration. 6 units. PROFESSOR WATSON

305-306. SEMINAR IN ENGLISH AND COMMONWEALTH HISTORY.—The work consists of practical training in the methods of historical research based on sources for modern British history. 6 units. PROFESSORS FERGUSON AND HAMILTON

307-308. SEMINAR IN UNITED STATES HISTORY.—6 units.
PROFESSORS HOLLEY AND WATSON, AND ASSOCIATE PROFESSOR DURDEN

309-310. SEMINAR IN AMERICAN COLONIAL AND REVOLUTIONARY HISTORY.—6 units. PROFESSOR ALDEN

315-316. SEMINAR IN SOUTHERN HISTORY.—Year course. 6 units.
PROFESSOR WOODY

317-318. SEMINAR IN THE HISTORY OF WESTERN EUROPE.—6 units.
PROFESSORS COLTON AND PARKER, AND ASSOCIATE PROFESSOR SCOTT

321-322. SEMINAR IN THE HISTORY OF SPAIN, HISPANIC AMERICA, AND INTER-AMERICAN RELATIONS.—6 units. PROFESSOR LANNING

343-344. SEMINAR IN THE HISTORY OF AMERICAN FOREIGN RELATIONS.—6 units.

347-348. SEMINAR IN RECENT INDIA.—6 units. PROFESSOR CRANE

361-362. SEMINAR IN THE HISTORY OF RUSSIA.—6 units.
PROFESSOR CURTISS

401. SEMINAR IN THE BRITISH COMMONWEALTH.—3 units.
PROFESSORS COLE, HAMILTON, AND SPENGLER

410. SEMINAR IN THE GOVERNMENT, HISTORY, AND SOCIAL STRUCTURE OF INDIA AND PAKISTAN.—3 units.
PROFESSOR BRAIBANTI, VISITING PROFESSOR ISLAM, ASSOCIATE PROFESSOR SINHA

HISTORIOGRAPHY AND THE TEACHING OF HISTORY

FOR GRADUATES

312. SEMINAR IN THE TEACHING OF HISTORY IN COLLEGE.—The work in this course is intended to acquaint students with the problems involved in teaching history in college. It includes critical observation of the teaching by members of the History staff in Duke University. Year course. 2 units.

Professor Manchester

This course is required of all candidates for the degree of Doctor of Philosophy who are in residence as many as two years at Duke University.

320. HISTORIOGRAPHY.—A critical study of the process of finding, appraising, and interpreting the sources of history and of the presentation of the results in narrative. Works of important historians from Herodotus to the present are analyzed. The student undertakes specific exercises in research, criticism, and narration. There is consideration of such general topics as schools, theories, philosophies, and the function of history. Year course. 4 units.

This course is required of all candidates for the degree of Doctor of Philosophy who are in residence as many as two years at Duke University.

HOSPITAL ADMINISTRATION

PROFESSOR BROWN, PROGRAM DIRECTOR—234-B BAKER HOUSE; PROFESSOR FRENZEL; ASSOCIATE PROFESSOR SWANSON; ASSISTANT PROFESSOR SMITH, COORDINATOR OF GRADUATE STUDIES—234-B BAKER HOUSE

Graduate study leading toward preparation for a career of administration in hospitals and other health agencies is offered through a 24-month program leading to the M.H.A. Degree. The program in Hospital Administration is composed of 36 graduate units, of which 18 are in Hospital Administration and 18 are in designated courses in Economics, Political Science, and Sociology. Included in the program is a 12-month administrative residency, a period of supervised administrative experience conducted under faculty supervision in hospitals and other health agencies located within commuting distance of the University campus. Admission to this program is limited to 12 students per year; selection is based on suitability for management of health agencies as well as on capability for graduate study. As there are requirements for participation in the program in Hospital Administration in addition to basic admission requirements of the Graduate School, interested individuals should obtain complete information on prerequisites and selection procedures from the Coordinator of Graduate Studies.

201. HISTORY AND DEVELOPMENT OF HOSPITALS AND OTHER HEALTH AGENCIES.—This course is designed to give the student a broad concept of the health field. It includes a study of the evolution of health institutions, analysis of medical care organizations in the United States, and an introduction to the medical sciences and to medical terminology. 3 units.

Assistant Professor Smith

203-204. PRINCIPLES OF ORGANIZATION AND MANAGEMENT OF HOSPITALS AND OTHER HEALTH AGENCIES.—A study of the hospital as an institution including its administrative structure, relationship of the medical staff, and the organization and function of each department. Emphasis is placed on the financial, legal, staffing, community relationship, and other managerial considerations of hospital administration. 6 units.

Professors Brown and Frenzel, Associate Professor Swanson, Assistant Professor Smith

211-212. SEMINARS IN HEALTH ADMINISTRATION.—A series of seminars designed to complement and add depth to the material covered during the first year, to analyze further the operation of hospitals and other health agencies, and to make the experiences of the residency meaningful.

Attention will be given to formalized techniques of problem-solving, decision-making, human relations, communications, and relating day-to-day experiences to the management process.

Special emphasis will be placed on social and economic aspects of health care and on identifying and projecting current trends in the health field. 6 units.
STAFF AND PRECEPTORS

215. ADMINISTRATIVE RESIDENCY (1 calendar year).—Designed to give the student broader and deeper knowledge and understanding of hospitals and other health agencies through practical experience. Varied experience is provided by rotation through a university medical center, a community hospital, a Veterans Administration and special hospitals, a public health department, a prepayment plan, and other governmental and voluntary health agencies. Two months of the residency will be spent in field experience with the Hospital Section of The Duke Endowment. 3 units. STAFF AND PRECEPTORS

MATHEMATICS

PROFESSOR GERGEN, CHAIRMAN—134 PHYSICS BUILDING; PROFESSOR ROBERTS, DIRECTOR OF GRADUATE STUDIES—227 PHYSICS BUILDING; PROFESSORS CARLITZ, DRESSEL, ELLIOTT, MURRAY, AND THOMAS; ASSOCIATE PROFESSORS GALLIE, REYNOLDS, SHOENFIELD, AND WARNER; ASSISTANT PROFESSORS BRYSON, BURDICK, HARRIS, HINRICHS, KELINGOS, PATRICK, SCOVILLE, SMITH, AND STACKELBERG

Graduate work in the Department of Mathematics is offered leading to the A.M. and Ph.D. degrees. The student, in his undergraduate work, must have had courses in differential and integral calculus, and at least 6 semester hours of other courses in mathematics on the junior or senior level.

The A.M. degree with a major in mathematics is awarded primarily on the basis of scholarship. Of the 24 units of course work required for this degree, 18 units must be taken in the Department of Mathematics.

The Ph.D. degree in mathematics is awarded upon the demonstration of ability and training in research. The original dissertation, therefore, is the most important of the formal requirements for the degree.

Since a reading knowledge of French, German, and Russian is highly desirable for the student of mathematics, he should satisfy the language requirements in two of these languages as early as possible.

213-214. MODERN ALGEBRA.—Construction of the number system. Introduction to groups, fields, rings, vector spaces, linear transformations, matrices. 6 units. (1965-66, Retired Officers Program only) PROFESSOR ROBERTS

215-216. INTERMEDIATE ANALYSIS.—Elements of the theory of functions, principally for real variables. Sequences and series, continuity, differentiation, integration. 6 units. (1965-66, Retired Officers Program only) PROFESSOR GERGEN

217-218. ANALYSIS.—Introduction to set theory, construction of real and complex numbers beginning with the Peano postulates, elementary topology of real and complex numbers, properties of continuous functions, derivatives, mean value theorem, Riemann integral, fundamental theorem of integral calculus. Prerequisite: Mathematics 64 for 217; and 217 for 218. 6 units. STAFF

221. DIGITAL COMPUTER.—History of computers; number representation, information storage, logical arithmetic; components and organization of computing systems; coding and programming; compilers; error analysis. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. The fee is payable to the Treasurer's Office of Duke University at the beginning of the semester. 3 units. ASSISTANT PROFESSOR PATRICK

222. INTRODUCTION TO NUMERICAL ANALYSIS.—Error analysis; real and complex roots of equations; finite difference methods and theory of interpolation; numerical differentiation and integration; numerical integration of ordinary and partial differential equations; simultaneous equations and matrix inversion. Prerequisite: Mathematics 221. 3 units. ASSOCIATE PROFESSOR GALLIE

225. THEORY OF EQUATIONS.—Permutations, determinants, matrices, linear systems, polynomials and their roots, constructibility, resultants, discriminants, simultaneous equations. 3 units. (Not 1965-66) STAFF

227-228. THEORY OF NUMBERS.—Congruences, arithmetic functions, compound moduli, quadratic reciprocity, Gauss sums, quadratic forms, sums of squares. Prerequisite: calculus. (Not 1965-66) PROFESSOR CARLITZ

229-230. ALGEBRAIC NUMBERS.—Ideals, unique factorization, divisors of the discriminant, determination of the class number. Prerequisite: theory of equations. 6 units. (Not 1965-66) PROFESSOR CARLITZ

233. STATISTICAL METHODS.—Parameter estimation and hypotheses testing from samples, linear regression, correlation, analysis of variance and covariance, components of variance, multiple regression. 3 units. ASSISTANT PROFESSOR BRYSON

234. SAMPLE DESIGNS.—Methods of constructing and analyzing survey designs; elements of simple random sampling, stratified sampling, multi-stage sampling; methods of estimation; questionnaire construction; refusals and not-at-homes. Prerequisite: Mathematics 233. 3 units. ASSISTANT PROFESSOR BRYSON

235-236. ABSTRACT ALGEBRA.—Groups, fields, rings, matrices, quadratic and bilinear forms, general Galois theory, hypercomplex systems. Prerequisite: calculus. 6 units. PROFESSOR THOMAS

244. DESIGN OF EXPERIMENTS.—Methods of constructing and analyzing designs for experimental investigations. Latin square, split-plot, simple and partially confounded factorial designs, incomplete block designs, treatment of missing data, techniques of experimentation. Prerequisite: Mathematics 233. 3 units. ASSISTANT PROFESSOR BURDICK

245-246. COMBINATION ANALYSIS.—Generating functions, permutations, distributions, partitions, compositions, trees, and networks. Prerequisite: calculus. 6 units. (Not 1965-66) PROFESSOR CARLITZ

247-248. ARITHMETIC OF POLYNOMIALS.—Field theory, detailed study of finite fields, special polynomials and functions, valuation theory, the zeta function. Prerequisite: Mathematics 236 or consent of the instructor. 6 units. (Not 1965-66) PROFESSOR CARLITZ

253-254. DIFFERENTIAL GEOMETRY.—Curves and surfaces in three-dimensional Euclidean space, applicability, differential parameters, Riemannian geometry of n-space. Prerequisite: calculus. 6 units. (Not 1965-66) PROFESSOR THOMAS

271-272. INTRODUCTORY TOPOLOGY.—Topological properties of Euclidean spaces, set-theoretic and combinatorial methods. Prerequisite: calculus. 6 units. ASSISTANT PROFESSOR HINRICHS

283. PROBABILITY FOR ENGINEERS.—Basic probability concepts, the sample space, discrete and continuous events, permutations and combinations, conditional and marginal probability, discrete and continuous distributions, expected values and moments, sampling distributions, estimation, hypothesis testing, confidence intervals, multiple regression, one-way analysis of variance. Prerequisite: calculus. 3 units. ASSISTANT PROFESSOR BURDICK

285. APPLIED MATHEMATICAL METHODS I.—Vectors, line and surface integrals, tensors, complex variables, differential and integral equations. Prerequisite: Mathematics 64. 3 units. PROFESSOR DRESSEL

286. APPLIED MATHEMATICAL METHODS II.—Wave equation, Fourier series, heat equations, telegraphic equation, Legendre polynomials, Bessel functions, Schrödinger's equation. Prerequisite: Mathematics 64. 3 units. PROFESSOR DRESSEL

287-288. FOUNDATIONS OF MATHEMATICS.—Propositional calculus, predicate calculus, axiomatized number theory. Gödel completeness and incompleteness theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 63, or consent of the instructor. 6 units. (1965-66) ASSOCIATE PROFESSOR SHOENFIELD

291-292. THEORY OF FUNCTIONS.—Limits, implicit functions, power series, double series, Cauchy's theorem and its applications, residues, Riemann surfaces, conformal mapping. Prerequisite: calculus. 6 units. ASSISTANT PROFESSOR STACKELBERG

FOR GRADUATES

325-326. REAL VARIABLE.—Number system, Lebesgue and Stieltjes integrals, topics in Fourier series. Prerequisite: Mathematics 291-292. 6 units.
ASSISTANT PROFESSOR SCOVILLE

327-328. PARTIAL DIFFERENTIAL EQUATIONS.—Boundary and initial value problems, regularity and existence theorems by methods of *a priori* estimates and functional analysis. Representations of solutions, spectral theory, and potential theory. Prerequisite: Mathematics 291-292 or consent of the instructor. 6 units. (1965-66) ASSISTANT PROFESSOR HARRIS

331-332. ADVANCED TOPICS IN COMPLEX VARIABLES.—Entire and meromorphic functions; harmonic functions and potential theory; Riemann surfaces; several complex variables. 6 units. (Not 1965-66) ASSISTANT PROFESSOR HARRIS

333-334. ANALYTIC THEORY OF NUMBERS.—Distribution of primes, primes in an arithmetic progression, Waring and Goldbach problems, applications of elliptic functions. Prerequisite: Mathematics 291-292. 6 units. (Not 1965-66)
PROFESSOR CARLITZ

337-338. EXISTENCE THEOREMS.—Systems of partial differential equations, Pfaffian systems, theorems of Cauchy, Riquier, and Cartan, singular integral varieties. Prerequisite: Mathematics 291-292. 6 units. (1965-66) PROFESSOR THOMAS

343-344. ORDINARY DIFFERENTIAL EQUATIONS.—Solution by separation of variables, exact differentials, integrating factors, solution in series. Cauchy's existence theorem, linear differential systems, singular points, partial differential equations equivalent to ordinary systems. Prerequisite: Mathematics 291-292. 6 units. (Not 1965-66) PROFESSOR THOMAS

371-372. DIMENSIONAL THEORY.—Abstract spaces, separation theory for Euclidean spaces, dimension theory. Prerequisite: Mathematics 271-272. 6 units. (1965-66) PROFESSOR ROBERTS

383-384. LIE GROUPS AND ALGEBRAS.—Differential manifolds; Lie groups; one-parameter subgroups; Lie algebras; differential forms; classification and representations of compact Lie groups and semisimple Lie algebras; solvable and nilpotent algebras; Ado's theorem. Prerequisites: Mathematics 236 and either Mathematics 272 or 292. (Not 1965-66) ASSOCIATE PROFESSOR SHOENFIELD

395-396. TOPOLOGICAL ALGEBRA.—Normed and locally convex spaces, Banach algebras. Prerequisites: Mathematics 236 and 292, or consent of instructor. 6 units. (1965-66) ASSOCIATE PROFESSOR WARNER

MICROBIOLOGY AND IMMUNOLOGY

PROFESSOR CONANT, CHAIRMAN—321 BELL BUILDING; ASSOCIATE PROFESSOR GROSS, DIRECTOR OF GRADUATE STUDIES, 350 BELL BUILDING; PROFESSORS AMOS, BEARD, LARSH, RUNDLES, SMITH, AND WILLETT; ASSOCIATE PROFESSOR DAY; ASSISTANT PROFESSORS BURNS, METZGAR, OSTERHOUT, ZMIJEWSKI

The Department of Microbiology and Immunology offers courses of study leading to A.M. and Ph.D. degrees. A description of the departmental facilities, staff, and Ph.D. and Masters programs can be obtained by writing to the Director of Graduate Studies. Special trainee stipends are available to a limited number of deserving applicants each year.

M211. HEMATOLOGY.—Three lectures and three laboratory periods of 3 hours each, weekly, for eleven weeks in the spring quarter. Prerequisites: courses in general zoology, general botany, histology, and comparative anatomy. 4 units.
PROFESSOR RUNDLES

M221. BACTERIOLOGY AND IMMUNOLOGY.—This course is devoted primarily to the study of the biological and immunological relationships of microorganisms (bacteria, fungi, Rickettsia, and viruses) in disease. Five lectures, two 1-hour conferences, and three laboratory periods of 3 hours each weekly, in fall

quarter. Prerequisites: courses in general zoology, general botany, histology and comparative anatomy, general and organic chemistry. 6 units.

PROFESSORS AMOS, CONANT, D. T. SMITH, WILLETT; ASSOCIATE PROFESSORS DAY, GROSS; ASSISTANT PROFESSORS BURNS, METZGAR, OSTERHOUT, ZMIJEWSKI

M291. MEDICAL PARASITOLOGY.—One lecture and one three-hour laboratory period per week for eleven weeks during the fall quarter. Prerequisites: courses in Zoology 204, general botany, histology and comparative anatomy. 1 unit.

PROFESSORS CONANT AND LARSH; INSTRUCTOR EIRING

231. FUNDAMENTALS OF IMMUNOLOGY.—A lecture course on general immunology including the following: non-specific factors in immunity, nature of antigens and antibodies, antibody production, complement, serological methods, blood groups, autoimmune diseases, tumor, immunity, transplantation immunity, and hypersensitivity. 2 units. (Spring Semester)

PROFESSOR AMOS; ASSOCIATE PROFESSOR DAY; ASSISTANT PROFESSORS METZGAR AND ZMIJEWSKI

302. MICROBIAL GENETICS.—A seminar and lecture course in microbial genetics with special emphasis on gene structure and functions. Admission by permission of instructor. 2 units. (Spring, alternate years) ASSOCIATE PROFESSOR GROSS

303. ANIMAL VIRUSES AND ANIMAL VIRUS DISEASES.—A seminar course to explore various aspects of virus morphology, growth characteristics, immunology and the pathogenesis of virus diseases. Admission with the approval of the staff. (Spring) 2 units. ASSISTANT PROFESSOR OSTERHOUT

310. MICROBIAL PHYSIOLOGY.—A lecture course devoted to an analysis of the structure and composition of microbes as related to function and growth. Attention will be given to microbial metabolism with emphasis on mechanisms controlling the production and utilization of metabolites. Two lectures per week. Prerequisite: Biochemistry 201 or equivalent. (Spring, alternate years; not given 1965). ASSISTANT PROFESSOR BURNS

311. ADVANCED IMMUNOLOGY.—Genetic control of antigen production, development of antigens in embryogenesis, destruction of antigens in tissue, relationship to differentiation, aggregation. Theories of antibody formation. Nature of antibodies; combining site; antibodies of similar specificity but different properties, reactivity of antibody fractions. Mechanisms of tolerance and immunological paralysis, split and partial tolerance, immunological enhancement. Cellular immunity and the reactions of circulating and cytrophilic antibody. Homograft rejections and auto immunity and delayed hypersensitivity. 2 units.

PROFESSOR AMOS; ASSOCIATE PROFESSOR DAY; ASSISTANT PROFESSORS METZGAR AND ZMIJEWSKI

312. CANCER IMMUNOLOGY.—An intensive and critical analysis of progress in a major branch of immunological research covering cancer antigens, the tumor-homograft reaction, and the immunotherapy of cancer. Prerequisite: consent of the instructor. 2 units. ASSOCIATE PROFESSOR DAY

313. IMMUNOHEMATOLOGY.—A lecture and laboratory demonstration course covering the serological, genetic, and anthropological aspects of human blood groups isoantigens and antibodies. 2 units. ASSISTANT PROFESSOR ZMIJEWSKI

314. IMMUNOCHEMISTRY.—The structure of antibody molecules. The nature of the combining site. The hapten as a molecular probe. Forces involved in antigen—antibody interaction. Specificity, avidity, and cross-reaction of antibodies. Purification of antibodies. Antibodies as analytical reagents. Prerequisites: Fundamentals of Immunology or Biochemistry or Physical Chemistry or consent of instructor. 2 units. ASSOCIATE PROFESSOR DAY

315. METHODS IN IMMUNOLOGY.—This is essentially a laboratory course in which the student will become familiar with the following methods of immunology: agar precipitation, immunoelectrophoresis, direct agglutination, indirect agglutination, immunofluorescence, complement-fixation and passive cutaneous anaphylaxis. 3 units. ASSISTANT PROFESSORS METZGAR AND ZMIJEWSKI

316. ANTIGENIC FACTORS IN GRAFT REJECTION.—Production of inbred

and co-isogenic strains. Mutation and recombination in inbred animals and tumors. Genetic control of histocompatibility iso-antigens in tumors and normal tissues, differential gene action in hybrids and tumors. Antigenic and immunogic factors in homograft rejection, tests for genetic compatibility. Modification of the immune response by genetic or immunologic procedures—tolerance, enhancement, suppression of antigens. 2 units. PROFESSOR AMOS

323. READINGS IN BACTERIOLOGY AND IMMUNOLOGY.—This course is intended primarily for graduate students majoring in bacteriology, but it is also available as a minor to other graduate students in related fields, to whom it is recommended by respective supervising committees and with the approval of the Department of Microbiology. Prerequisites: Bacteriology and Immunology, M221. 4 units per semester. PROFESSOR SMITH

324. RESEARCH SEMINAR ON VIRUSES.—Limited to advanced students. 2 units per semester. PROFESSOR BEARD

325. MEDICAL MYCOLOGY.—This course is intended to familiarize the graduate student majoring in mycology with the fungi causing disease in man and animal. The course includes practical laboratory work with materials from patients in Duke Hospital and those sent to the Duke Fungus Registry from outside sources. Prerequisites: A.M. in Botany with major in mycology and M221. Course limited to four students each year. 4 units per semester. PROFESSOR CONANT

326-327. MICROBIOLOGY SEMINAR.—Graduate students and staff meet weekly to discuss and review recent microbiological literature. Required of all graduate students who are candidates for the A.M. or Ph.D. degree. 2 units.

328. SEMINAR IN IMMUNOLOGY.—Selected topics on various aspects of immunology will be discussed. Seminars will be by both students and faculty. I unit. Spring semester. ASSISTANT PROFESSOR METZGAR

PHILOSOPHY

PROFESSOR BAYLIS, CHAIRMAN—212D WEST DUKE BUILDING; PROFESSOR WELSH, DIRECTOR OF GRADUATE STUDIES—212A WEST DUKE BUILDING; PROFESSORS CLARK, NEGLEY, AND PEACH; ASSOCIATE PROFESSOR WILSON; ASSISTANT PROFESSORS BINKLEY AND SPECTOR

The Department of Philosophy offers graduate work leading to the A.M. and Ph.D. degrees. Tutorial work complements formal instruction. Students may specialize in any of the following fields: the History of Philosophy; Logic; Philosophy of Science; Epistemology; Metaphysics; Philosophical Analysis; Ethics; Aesthetics; Political Philosophy and Philosophy of Law. Applicants for admission should offer scores of the Graduate Record Examination or the Miller Analogies Test. Scores are required of applicants for an award.

Individual programs of study are developed for each student. The following requirements, however, are fundamental: (1) In February of their first year new graduate students in philosophy who are not then taking the preliminary examinations for the Ph.D. are required to take three qualifying examinations: one in the history of philosophy, ancient and modern; one on a central philosophical topic, treated systematically; and one in logic, both classical and symbolic. The examination in logic will be waived if, during the first semester, a student has passed with a grade of E or G Philosophy 331c, Logic. A student's achievement on these examinations will be regarded as indicative of his ability to undertake advanced graduate work. (2) Preliminary examinations for the Ph.D., which may be taken only after a student has met the language requirements for that degree, should be taken during the first year of study beyond the A.M. degree, but in any case not later than the end of the second year. In these examinations students are expected to combine historical knowledge with critical understanding.

Work in a minor field outside of the Department, but not necessarily confined to any one department, must include six units for the A.M. or the Ph.D. and may include more as a student's program requires or permits.

FOR SENIORS AND GRADUATES

202. AESTHETICS: THE PHILOSOPHY OF CRITICISM.—A study of some fundamental issues in aesthetics with particular reference to the fields of literature, music and painting. Problems discussed include the role of standards in criticism, aesthetic judgment, interpretation and evaluation in literature, meaning in the arts, art and truth, the arts and morality. 3 units. PROFESSOR WELSH

203. CONTEMPORARY ETHICAL THEORIES.—Study of the nature and justification of basic ethical concepts and principles in the light of the chief ethical theories of twentieth-century British and American philosophers.
PROFESSOR BAYLIS AND ASSISTANT PROFESSOR BINKLEY

205. PHILOSOPHY OF HISTORY.—Discussion of the method, metaphysical implications and influence of interpretations of history: Hegel, Marx, Spengler, Toynbee. 3 units. PROFESSOR NEGLEY

208. POLITICAL VALUES.—Analysis of the systematic justification of political principles and the status of political values in the administration of law. 3 units.
PROFESSOR NEGLEY

211. PLATO.—A critical study of the dialogues with special emphasis on problems in ethics, epistemology, and metaphysics. 3 units.
ASSISTANT PROFESSOR BINKLEY

217. ARISTOTLE.—A study of parts of the *Organon, Physics,* and *Metaphysics.* 3 units. ASSOCIATE PROFESSOR WILSON

219. KANT.—Reading and discussion of his philosophy, with some attention to historical continuity. 3 units.* PROFESSOR NEGLEY

225. BRITISH EMPIRICISM.—A critical study of the writings of Locke, Berkeley, or Hume, with special emphasis on problems in the theory of knowledge. 3 units. (1965-66 Hume) PROFESSOR PEACH

227. CONTINENTAL RATIONALISM.—A critical study of the writings of Descartes, Spinoza, or Leibniz, with special emphasis on problems in the theory of knowledge and metaphysics. 3 units. PROFESSOR PEACH

228. RECENT AND CONTEMPORARY PHILOSOPHY.—A critical study of some contemporary movements in philosophy with special emphasis on the work of Moore, Russell, Wittgenstein, Wisdom, and Ryle. 3 units. PROFESSOR WELSH

229. AMERICAN PRAGMATISM.—Studies in the philosophy of Peirce, James, Dewey, and Mead. 3 units.* PROFESSOR WELSH

230. THE MEANING OF RELIGIOUS LANGUAGE.—An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. Prerequisite: Contemporary Theology 232-233 or consent of instructor. (Also listed as Religion 230.) 3 units. ASSOCIATE PROFESSOR POTEAT

233. INTRODUCTION TO THE PHILOSOPHY OF SCIENCE.—A systematic study of some central problems in the methodology of the sciences, e.g., the concept of a scientific explanation, theory and observation, and other topics. 3 units. (1965-66) ASSISTANT PROFESSOR SPECTOR

234. PHILOSOPHY AND THE SCIENCES.—Selected problems in the physical and non-physical sciences. Topics such as space, time, measurement, probability, and induction, and problems in the philosophy of the behavioral and social sciences. Prerequisite, Philosophy 233. 3 units. (1965-66) ASSISTANT PROFESSOR SPECTOR

235. PHILOSOPHY AND THE SCIENCES.—An introduction to the philosophy of science with emphasis on the writings of philosophers and scientists in the history of science, such as Galileo, Newton, Mach, Poincare, and Einstein. 3 units.
ASSISTANT PROFESSOR SPECTOR

236. SPECIAL PROBLEMS IN THE PHILOSOPHY OF SCIENCE.—Selected topics concerning the methods of the sciences and the philosophy of science. Prerequisite: previous work in the philosophy of science or the consent of the instructor. 3 units. ASSISTANT PROFESSOR SPECTOR

241. LOGIC.—Fundamental Problems of Logic. 3 units.*
PROFESSOR CLARK AND ASSOCIATE PROFESSOR WILSON

246. GENERAL SEMANTICS AND THEORY OF LANGUAGE.—An examination of semantical theory through Frege, Russell, Carnap and Quine, together with a consideration of the implications of meaning theory for general philosophy. 3 units.* ASSOCIATE PROFESSOR WILSON

250. PHILOSOPHICAL ANALYSIS.—A critical study of recent and contemporary essays in philosophical analysis, and an evaluation of the nature, methods, and results of this movement. 3 units.

PROFESSORS BAYLIS, CLARK, AND ASSISTANT PROFESSOR BINKLEY

252. METAPHYSICS.—A critical and evaluative study of rival metaphysical theories and their bases. Analysis of the fundamental metaphysical categories and of metaphysical methods. 3 units. PROFESSOR BAYLIS

287-288. FOUNDATIONS OF MATHEMATICS.—Propositional calculus, predicate calculus, axiomatized number theory. Godel completeness and incompleteness theorems. Recursive functions; hierarchies; constructive ordinals. Set theory; consistency of the axiom of choice. Prerequisite: Mathematics 53, or consent of instructor. 6 units. (Also listed as Mathematics 287-288.)

ASSOCIATE PROFESSOR SHOENFIELD

291, 292. CRITICAL PHILOSOPHY.—The analysis of basic philosophical concepts and beliefs with a view to critical evaluation and constructive emendation of them. Emphasis on the practice as well as the principles of philosophical criticism and problem-solving. 3 units each. Enrollment only by permission of the Department. 291 is ordinarily prerequisite for 292.

ALL MEMBERS OF THE GRADUATE STAFF

FOR GRADUATES

331, 332. SEMINAR IN SPECIAL FIELDS OF PHILOSOPHY.—3 units.

ALL MEMBERS OF THE GRADUATE STAFF

PHYSICS

PROFESSOR FAIRBANK, CHAIRMAN—119 PHYSICS BUILDING; PROFESSOR GREULING, DIRECTOR OF GRADUATE STUDIES; PROFESSORS BIEDENHARN, FOWLER, GORDY, LEWIS, MEYER, NEWSON, NIELSEN, SPONER; ASSOCIATE PROFESSOR ROBINSON; ASSISTANT PROFESSORS BILPUCH, EVANS, FORTNEY, MIYAGAWA, ONLEY, ROBERSON, TILLEY, AND WALTER; INSTRUCTORS GUYER, HUNT, AND WINNEWISSER

The Department of Physics offers graduate work leading to the A.M. and Ph.D. degrees. Course work is designed to give a broad basic foundation in classical and modern physics. All graduate students will be expected to acquire a thorough knowledge of the various branches of classical physics and some familiarity with modern physics and with basic laboratory skills. They will be required to take such course work in the 200-number courses as may be necessary to obtain this foundation.

The student will be required to take such course work as will best be adapted to the kind of work he will subsequently specialize in and to the kind of research he will undertake. The choice of minor will be similarly determined.

Since a practical reading knowledge of French and German is highly desirable for the student of physics, he should satisfy these language requirements as early as possible.

FOR SENIORS AND GRADUATES

201-202. MECHANICS.—The fundamental principles of Newtonian mechanics; general dynamics of systems of particles and rigid bodies; the methods of Lagrange and Hamilton; generalized mechanics. Prerequisite: Physics 125. 6 units.

PROFESSOR GREULING

213-214. CONTEMPORARY PHYSICS.—A course which covers the fundamental concepts and the experimental basis of modern physics. 6 units.

ASSISTANT PROFESSOR WALTER

217-218. ADVANCED PHYSICS LABORATORY.—Measurements involving the

fields of mechanics, electricity, magnetism, heat, sound, optics and modern physics. 2-6 units. ASSOCIATE PROFESSOR MEYER

220. ADVANCED ELECTRONICS.—Vacuum tubes and solid state devices, advanced circuit analysis. 3 or 4 units. INSTRUCTOR HUNT

221-222. THEORETICAL PHYSICS.—Mechanics of particles and of rigid bodies, elasticity, fluids dynamics, electrodynamics; optics, relativity, thermodynamics, statistical mechanics, wave mechanics. Prerequisite: Mathematics 285-286 or equivalent to be taken at least concurrently. 6 units. INSTRUCTOR WINNEWISSER

223-224. ELECTRICITY AND MAGNETISM.—Electrostatics, magnetostatics, and potential theory; dielectric and magnetic media; magnetic field of currents and the law of induction. Maxwell's electrodynamics, theory of wave optics, refraction, interference, and diffraction. Prerequisite: Physics 126. 6 units.
ASSOCIATE PROFESSOR ROBINSON

FOR GRADUATES

303, 304. THERMODYNAMICS, STATISTICAL MECHANICS.—Fundamental laws of thermodynamics and statistical mechanics with applications to physics and chemistry. Properties of gases and elements of quantum statistics. 6 units.
INSTRUCTOR GUYER

306. LOW TEMPERATURE PHYSICS.—A study of the properties of matter near the absolute zero of temperature; superconductivity, liquid helium, adiabatic demagnetization. Prerequisite: Physics 303. 3 units. PROFESSOR FAIRBANK

309. SOLID STATE.—A study of matter in the condensed state, including metals, insulators and semiconductors; theory of cooperative effects; thermal and magnetic properties of matter. Prerequisite: Physics 303. 3 units. PROFESSOR MEYER

315-316. PRINCIPLES OF QUANTUM THEORY.—Original and fundamental concepts of quantum theory; wave and matrix mechanics; theory of measurements; exclusion principle and electronic spin. Prerequisite: Physics 201-202. 6 units.
ASSOCIATE PROFESSOR ONLEY

317. INTERMEDIATE QUANTUM THEORY.—General operator methods; angular momentum; Dirac electron theory. Second quantization; symmetry principles and conservation theorems. Applications to the theory of solids, of nuclei, and of elementary particles will be stressed. Prerequisite: Physics 315-316. 3 units.
ASSISTANT PROFESSOR EVANS

319. ELECTROMAGNETIC FIELD THEORY.—Radiation of electric and magnetic multipole fields; special relativity; covariant electrodynamics; Lienard-Wiechert potentials; scattering and dispersion; Hamiltonian field equations. Prerequisite: Physics 223-224. 3 units. PROFESSOR BIEDENHARN

323. THEORY OF ATOMIC SPECTRA.—Excitation of spectra, computation of wave lengths from photographs of spectra, study of the structure of atomic spectra with applications. 3 units.* PROFESSOR SPONER

324. THEORY OF MOLECULAR SPECTRA.—A study of the structure of molecular spectra with applications. 3 units.* PROFESSOR SPONER

331. MICROWAVE RADIATION.—Microwave generators, cavity resonators, transmission lines, radiation propagation and detection. 3 units.* PROFESSOR GORDY

335. MICROWAVE SPECTROSCOPY.—Application of microwaves in the determination of molecular, atomic, and nuclear properties. Stark and Zeeman effects in microwave spectroscopy. Magnetic resonance absorption. 3 units.*
PROFESSOR GORDY

341. ADVANCED TOPICS IN QUANTUM THEORY.—Quantum theory of radiation and collisions with special reference to nuclear and high energy physics. Prerequisite: Physics 315-316. 3 units.* PROFESSOR BIEDENHARN

343. NUCLEAR PHYSICS.—Elementary theory of the deuteron; low energy neutron proton scattering; theory of nuclear reactions; penetration of potential barriers; nuclear energy levels. Prerequisite: Physics 315. 3 units. PROFESSOR NEWSON

344. ADVANCED NUCLEAR PHYSICS.—The deuteron, nuclear forces, scatter-

ing of elementary particles, beta-radiation. Other aspects of nuclear physics susceptible of theoretical interpretation. Prerequisite: Physics 343. 3 units.*

PROFESSOR BIEDENHARN

345. HIGH ENERGY PHYSICS.—Experimental and theoretical aspects of high energy nuclear processes; properties of mesons and hyperons. 3 units.

PROFESSOR FOWLER

346. TOPICS IN THEORETICAL PHYSICS.—The content of this course will vary from year to year. General methods in quantum mechanics such as: group theory and its applications; elementary particle theory; field theory; theory of solids; theoretical nuclear physics; atomic and molecular structure. The topic for Spring 1966 will be group theory. Prerequisite: Physics 315-316. 3 units.

351-352. SEMINAR.—A series of weekly discussions on topics related to the research projects under investigation in the department. 2 units.

ALL MEMBERS OF THE GRADUATE STAFF

PHYSIOLOGY AND PHARMACOLOGY

PROFESSOR TOSTESON, CHAIRMAN—203 MEDICAL SCHOOL; ASSOCIATE PROFESSOR KOSTYO, DIRECTOR OF GRADUATE STUDIES—251 MEDICAL SCHOOL; PROFESSORS F. BERNHEIM, HALL, AND RENKIN; ASSOCIATE PROFESSORS BLUM, DETURK, HOROWICZ, JOHNSON, LONG, AND MOORE; ASSISTANT PROFESSORS HOCHSTEIN, MCMANUS, OTTOLENGHI, SALZANO, AND SOMJEN

In the Department of Physiology and Pharmacology graduate work is offered leading to the A.M. and Ph.D. degrees. Before undertaking graduate work in physiology or pharmacology a student should have a strong background in basic science including course work in mathematics, chemistry, physics and biology. Students are accepted for graduate work who have undergraduate majors in any of the following areas: biology, chemistry, physics, engineering. A brochure is available from the department which describes the program of study, financial assistance, facilities, and the research activities of the staff.

M204. TOPICS IN MUSCLE PHYSIOLOGY.—This course will cover the following topics: Cellular basis of activity in skeletal, cardiac and smooth muscle; ionic properties of muscle membranes; submicroscopic structure of muscle and the molecular basis of contraction; the problem of electro-mechanical coupling; the mechanics and thermodynamics of muscular contraction; design and control problems for the production of movement in various animals. 2 units.

ASSOCIATE PROFESSOR HOROWICZ

M205. PHYSIOLOGICAL MODELS.—This course is primarily intended for students with some background in electrical engineering. It will cover the following topics: energy transformation and storage in single cells; membrane model circuit diagrams and cable properties; membrane non-linear-current relations: nerve impulse transmission; excitation and inhibition; mechanics and thermodynamics of muscles; electrical analysis of cardiovascular-respiratory systems. 3 units.

ASSOCIATE PROFESSOR MOORE

M260. CELLULAR ASPECTS OF DRUG ACTION.—An introduction to cell-drug interaction with emphasis placed on mechanisms of action and structure-activity relationships of chemical agents. Prerequisites: organic chemistry, introductory animal or plant physiology. Undergraduates by permission of instructors. 1 unit.

PROFESSOR F. BERNHEIM; ASSOCIATE PROFESSOR DETURK AND ASSISTANT PROFESSOR OTTOLENGHI

M261-262. HUMAN PHYSIOLOGY.—Six lectures and twenty laboratory hours per week. Prerequisites: Anatomy M201 and Biochemistry M241 (or equivalents) and at least one year of college physics. Feb.-June. Credits depending on work taken. (Maximum 8 units.)

ALL MEMBERS OF THE GRADUATE STAFF

M271. CONTEMPORARY PHYSIOLOGY.—Contemporary physiology taught from the current literature. Prerequisite: Physiology M261-262 or the equivalent. 4 units.

ALL MEMBERS OF THE GRADUATE STAFF

M279. INTRODUCTORY SEMINAR IN PHYSIOLOGY.—Weekly discussions by the staff outlining the scope of modern physiology. Required of all graduate students majoring in physiology. 1 unit. ALL MEMBERS OF THE GRADUATE STAFF

M365. RESPIRATION AND AERO-PHYSIOLOGY.—A study of the fundamental respiratory processes in living organisms, and of the special physiological responses and adjustments of the individual during high-altitude flight. Lectures, conferences, laboratory. Prerequisites: M261-262 or equivalent. 4 units.
PROFESSOR HALL AND ASSISTANT PROFESSOR SALZANO

M369. PHARMACOLOGY. MODE OF ACTION OF DRUGS.—Studies and discussions of the pharmacological action of drugs in terms of biochemical and physiological processes. Lectures, conferences, and laboratory. Prerequisites: M261-262 or equivalent. 4 units. PROFESSORS F. BERNHEIM AND RENKIN; ASSOCIATE PROFESSORS DETURK AND JOHNSON; ASSISTANT PROFESSORS HOCHSTEIN AND OTTOLENGHI

M370. SEMINAR.—A weekly meeting in which original researches by members of the staff and guests are reported. Required of all graduate students who are candidates for the M.A. or Ph.D. degree. 2 units.
ALL MEMBERS OF THE GRADUATE STAFF

M371. TOPICS IN PULMONARY AND CARDIOVASCULAR PHYSIOLOGY.—This course is concerned with processes which account for exchange of gases with the atmosphere, aeration of the blood, transport of oxygen and carbon dioxide, and exchange of gases at the tissues. Emphasis is placed on classical experiments describing physical factors in thoracic motion, ventilation-perfusion relations, function of hemoglobin as carrier of oxygen and carbon dioxide, flow-pressure relations in the gas and blood streams, and factors which disturb the exchange of gases in the pulmonary and systemic capillaries. Prerequisites: M261-262 or equivalent. 2 units. ASSOCIATE PROFESSOR LONG, AND ASSISTANT PROFESSOR SALZANO

M372. RESEARCH.—Individual investigations in the various fields of physiology. Credits to be arranged. ALL MEMBERS OF THE GRADUATE STAFF

M373. CELLULAR ENDOCRINOLOGY.—Current concepts of the mechanism of action of hormones are covered with special reference made to the effects of hormones on cell membrane permeability and on the activity of enzyme systems. The relationships of these cellular actions of hormones to the hormonial regulation of growth, metamorphosis, osmoregulation, pigmentation and reproduction are discussed. 2 units. ASSOCIATE PROFESSOR KOSTYO

M375. PHYSIOLOGY OF EXCITABLE CELLS.—This course includes the following topics: Membrane circuit diagrams and cable properties; Energy storage and discharge in nerve, muscle; Membrane non-linear voltage-current relations; Axonal and junctional transmission; Cellular organization and electrical activity in skeletal, cardiac and smooth muscle; Electro-mechanical coupling; Thermodynamics of muscle; Mechanics of muscular contraction; and Molecular basis of contraction. 2 units. ASSOCIATE PROFESSORS HOROWICZ AND MOORE

M377. CELLULAR TRANSPORT PROCESSES.—A sequential study of the following topics: The physical chemistry of transport processes which occur in living cells (e.g. diffusion, flow, electric current); contemporary knowledge of the molecular mechanism of salt and water transport across cell membranes with special reference to the conversion of chemical bond energy to transport work in active transport; the integration of transport processes in individual plasma membranes to accomplish regulation of cytoplasmic salt and water composition and cell volume, as well as the secretion of fluids across epithelial cell layers in organs specialized for this function (intestine, kidney). 2 units.
PROFESSOR TOSTESON AND ASSISTANT PROFESSOR MCMANUS

M379. PHYSIOLOGY OF THE CENTRAL NERVOUS SYSTEM.—The literature concerned with the integrative aspects of neurophysiology will be explored with emphasis upon the mammalian nervous system. Topics to be considered include: properties of central neurons, synaptic excitation and inhibition, reflex organization of the spinal cord, receptor organs and sensory codes in the central nervous

system, organization of motor functions and integration of autonomic functions. Prerequisites: Physiology M261-262 or equivalent. 2 units.

ASSISTANT PROFESSOR SOMJEN

POLITICAL SCIENCE

PROFESSOR HALLOWELL, CHAIRMAN—307 LIBRARY; ASSOCIATE PROFESSOR SINDLER, DIRECTOR OF GRADUATE STUDIES—306 LIBRARY; PROFESSORS BALL, BRAIBANTI, COLE, CONNERY, KULSKI, RANKIN, AND WILSON; ASSOCIATE PROFESSORS HALL, LEACH, AND PROCTOR; VISITING ASSOCIATE PROFESSOR HULL

The Department of Political Science offers graduate work leading to the A.M. and Ph.D. degrees. Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the A.M. degree.

Instruction is designed to prepare the student for teaching, for government service, and for other work related to public affairs. Before undertaking graduate study in political science, a student is ordinarily expected to have completed at least 12 semester hours of course work in political science, including some work in American government.

Fields of political science in which instruction is at present offered for candidates for the degree of Doctor of Philosophy are the following: American Government and Constitutional Law; Comparative Government (with special reference to European Institutions, Southern Asia, Soviet Institutions, or Commonwealth Institutions); Political Theory; American State and Local Government; International Law and Organization; Public Administration; Political Parties and Voting Behavior. Candidates for the degree of Doctor of Philosophy who propose to major in political science must elect five fields including Comparative Government and Political Theory; at least one of the five fields must be taken in a department other than the Department of Political Science.

FOR SENIORS AND GRADUATES

207. AMERICAN CONSTITUTIONAL LAW AND THEORY.—A study of leading principles of American government, as developed through judicial interpretation of the Constitution. 3 units. PROFESSOR RANKIN

208. AMERICAN CONSTITUTIONAL LAW AND CURRENT NATIONAL PROBLEMS.—A study of the influence of recent Supreme Court decisions upon the political and constitutional development of the United States. 3 units.

PROFESSOR RANKIN

209. PROBLEMS IN STATE AND LOCAL GOVERNMENT IN THE UNITED STATES.—A study of the historical development of the state and local governments, their present organization and subdivisions and their relation to each other. Special attention is given to the position of the states in the federal union through the study of federal-state, inter-state, and state-local relations. 3 units.

PROFESSOR RANKIN

221. INTERNATIONAL PUBLIC ORGANIZATION.—A study of the structure and functioning of the United Nations organs, of related specialized agencies such as the International Labor Organization, and of regional agencies such as the Organization of American States and the North Atlantic Treaty Organization. 3 units. PROFESSOR WILSON

223. POLITICAL PHILOSOPHY FROM PLATO TO MACHIAVELLI.—An intensive analysis of the political philosophies of Plato and Aristotle followed by a survey of medieval political thought and an analysis of the significance of Machiavelli. 3 units. PROFESSOR HALLOWELL

224. MODERN POLITICAL THEORY.—An historical survey and philosophical analysis of political theory from the beginning of the seventeenth to the middle of the nineteenth century. Attention is given to the rise of liberalism, the Age of Enlightenment, the romantic and conservative reaction, idealism and utilitarianism. 3 units. PROFESSOR HALLOWELL

225. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study

of modern political institutions and processes, with particular attention to European constitutional government and politics. 3 units.

PROFESSOR COLE AND ASSOCIATE PROFESSOR PROCTOR

226. COMPARATIVE GOVERNMENT AND POLITICS.—A comparative study of modern political institutions and processes, with particular attention to European totalitarian and authoritarian political systems. 3 units.

PROFESSOR COLE AND ASSOCIATE PROFESSOR PROCTOR

227-228. INTERNATIONAL LAW.—Elements of international law, particularly as interpreted and applied by the United States; rights and duties of states with respect to recognition, state territory and jurisdiction, nationality, diplomatic and consular relations, treaties, treatment of aliens, pacific settlement of disputes, international regulation of the use of force, and collective responsibility. 6 units.

PROFESSOR WILSON

229. RECENT AND CONTEMPORARY POLITICAL THEORY.—The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Christianity and the social order. 3 units. PROFESSOR HALLOWELL

230. AMERICAN POLITICAL INSTITUTIONS.—A study of the formation and development of institutions of the national government in the United States, with historical and analytical treatment. Among other topics, this course is concerned with the Constitutional Convention of 1787, and the development of Congress, the Presidency, and the Supreme Court. 3 units. PROFESSOR RANKIN

231. AMERICAN POLITICAL THEORY.—An analysis of the main currents in American political thought from colonial beginnings to the present day, with emphasis upon the development of liberalism in America. 3 units.*

PROFESSOR HALLOWELL

234. CIVIL-MILITARY RELATIONSHIPS IN AMERICAN GOVERNMENT.—A consideration of the role of the military in American government both in practice and in theory. Special emphasis will be given to formal civil-military structural arrangements for determining policies such as the National Security Council, and to the degree of civilian control within the military establishment. 3 units.*

PROFESSOR CONNERY

235. THE BRITISH COMMONWEALTH.—An analysis of the political relationships between the members of the Commonwealth and a comparative study of the political systems of the Commonwealth countries, with particular reference to Canada. A course designed in part to utilize the occasional services of visiting professors from Commonwealth countries. 3 units. PROFESSOR COLE

241. ADMINISTRATIVE MANAGEMENT.—An advanced course in public administration with special attention being given to the development of scientific management, its application to government in the United States, and a consideration of current problems in organization, procedures, work simplification, and management improvement. 3 units. PROFESSOR CONNERY

242. NATIONAL ADMINISTRATION.—A study of the administrative organization, working concepts and procedures of the United States Government, illustrated through the operations of the Bureau of the Budget. 3 units.

PROFESSOR CONNERY

244. ADMINISTRATIVE LAW AND PROCESS.—The nature and law of the administrative process in the context of American government and politics, with special attention to the powers, procedures, and judicial control of administrative agencies. 3 units. ASSOCIATE PROFESSOR HALL

246. GOVERNMENT ADMINISTRATION AND PUBLIC POLICY.—Through use of the laboratory and case study techniques, a consideration of the types of administrative problems that the United States Government encounters in the field of public policy, and their possible solution. 3 units.* PROFESSOR CONNERY

250. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA I. —Methodology of comparative political analysis. Institutional, functional problem-

atic and culture-analytic approaches compared. Theoretical problems of induced political and administrative change, using India and Pakistan as case studies. 3 units. PROFESSOR BRAIBANTI

251. COMPARATIVE GOVERNMENT AND POLITICS: SOUTHERN ASIA II. Political modernization of India and Pakistan with emphasis on constitutional change, development of ideology, bureaucratic transition, party politics, law as an instrument of political change, and the community development movement. 3 units.

275. THE NATIONAL PARTY SYSTEM.—An intensive examination of selected facets of American national political parties, such as relationships between presidential and congressional politics, the politics of national conventions, and the controversy over party government. 3 units. ASSOCIATE PROFESSOR SINDLER

276. COMPARATIVE STATE PARTIES AND POLITICS.—A selective analysis of party patterns in the states, including such topics as: classification schemes for state party systems, the impact of various nominating procedures on party organization, relationships between national and state politics, and the influence of party system on the operation of state government, with special attention to the South. 3 units. ASSOCIATE PROFESSOR SINDLER

280. COMPARATIVE GOVERNMENT AND POLITICS—SUB-SAHARAN AFRICA.—Particular attention will be given to traditionalism and modernization, ideologies, leadership, party systems, the adaptation of parliamentary institutions, Africanization of the civil services, and the problem of political integration. 3 units. ASSOCIATE PROFESSOR PROCTOR

291. PROBLEMS OF URBAN GOVERNMENT.—An analysis of problems arising from the structure and functions of urban governments in the United States with particular attention to the current problems of metropolitan areas. 3 units. PROFESSOR RANKIN AND ASSOCIATE PROFESSOR LEACH

292. URBAN ADMINISTRATION.—A study of the administration of governmental programs and policies by governments in metropolitan areas with special attention to problems of organization, jurisdiction, and administrative responsibility. 3 units. PROFESSOR RANKIN AND ASSOCIATE PROFESSOR LEACH

321. SEMINAR IN POLITICAL THEORY.—Open to students who have completed 6 units in Political Science 223, 224, 229, 231 or their equivalents. 3 units. PROFESSOR HALLOWELL

325. SEMINAR IN COMPARATIVE GOVERNMENT.—Open to students who have completed courses 225 or 226 or equivalents. 3 units. PROFESSOR COLE

328. SEMINAR IN INTERNATIONAL LAW.—Open to students who have completed course 227-228 or its equivalent. 3 units. PROFESSOR WILSON

330. SEMINAR IN COMPARATIVE GOVERNMENT AND POLITICS—SOUTHERN ASIA.—Emphasis on research using documentary materials relating to India, Pakistan, Ceylon, and Malaya. Open to students who have completed courses 250, 251 or their equivalents. 3 units. PROFESSOR BRAIBANTI

341. SEMINAR IN PUBLIC ADMINISTRATION.—Directed reading, discussion and reports concerning the theory and practice of public administration. 3 units. PROFESSOR CONNERY

360. SEMINAR IN RUSSIAN GOVERNMENT.—Open to students who have completed courses 226 or 260, or on individual approval by the instructor. 3 units. PROFESSOR KULSKI

361. SEMINAR IN FOREIGN RELATIONS OF THE SOVIET UNION.—Open to students who have completed courses 226 or 260 or 360, or on individual approval by the instructor. 3 units. PROFESSOR KULSKI

376. SEMINAR IN POLITICAL BEHAVIOR.—Open to students who have completed courses 275 and 276 or their equivalents, or by special approval of the instructor. 3 units. ASSOCIATE PROFESSOR SINDLER

401. SEMINAR IN THE BRITISH COMMONWEALTH.—3 units. PROFESSORS COLE, HAMILTON, SPENGLER, AND BRAIBANTI

410. SEMINAR IN THE GOVERNMENT, HISTORY, AND SOCIAL STRUCTURE OF INDIA AND PAKISTAN.—3 units.

PROFESSOR BRAIBANTI AND ASSOCIATES

RELATED COURSE WORK IN THE SCHOOL OF LAW

There may be graduate credit for course work completed in the Duke University School of Law, under regulations referred to on page 24 of this *Bulletin*.

PSYCHOLOGY

PROFESSOR ALEXANDER, CHAIRMAN, 240 PSYCHOLOGY-SOCIOLOGY BUILDING; PROFESSOR GUTTMAN, DIRECTOR OF GRADUATE STUDIES, 103 PSYCHOLOGY-SOCIOLOGY BUILDING; PROFESSORS ADAMS, DAI, DIAMOND, JONES, AND KIMBLE; ASSOCIATE PROFESSORS BANHAM, BONEAU, BORSTELMANN, BREHM, CARSON, LAKIN, AND WALLACH; ASSOCIATE RESEARCH PROFESSOR GAFFRON; ASSISTANT PROFESSORS ALTROCCHI, ERICKSON, GREENWOOD, KREMEN, AND SCHIFFMAN; LECTURERS COHEN, CROVITZ, EISDORFER, GEHMAN, KRUGMAN, OBRIST, PEELE, SHMAVONIAN, SOMJEN, STEDMAN, AND THOMPSON

The Department offers work leading to the A.M. and Ph.D. degrees. For the Ph.D. degree the areas of concentration are: theoretical experimental psychology, including physiological and comparative psychology; social psychology; and personality clinical psychology. All fields of specialization presuppose thorough preparation in the general methods, data, and theories of psychology. Programs of study are typically arranged to provide this common background in the first year or two, with increasing specialization in course work and research in subsequent years. Early in the second year of residence, the Ph.D. student is expected to have planned his further program of specialized studies; by the end of the second year, when the preliminary examination is normally taken, the doctoral dissertation plan should be formulated. An original dissertation demonstrating independent research competence and scholarship is the most important formal requirement for the Ph.D. degree.

Students specializing in clinical psychology undertake field work in a variety of settings, and an integral part of this program is a one-year internship in an approved and appropriate institution. Clinical internship is arranged for the third year of study or later year, depending on the student's progress and needs.

Minor work in a variety of fields is available, but the areas most relevant to graduate work in psychology are the biological sciences (zoology, neuroanatomy, physiology), mathematics and statistics, sociology and anthropology, and philosophy of science.

Further details concerning the program of studies in psychology may be obtained from the Director of Graduate Studies in Psychology.

203. PSYCHOLOGY OF PERCEPTION.—An examination of current systematic formulations with emphasis upon the intensive analysis of a variety of representative investigations. 3 units.

204. COMPARATIVE PSYCHOLOGY.—The study of behavior as related to species and of speciation as dependent upon behavior; instinct, imprinting, and learning at different phylogenetic levels. 3 units. PROFESSOR ADAMS

209. EXPERIMENTAL METHODS IN PSYCHOLOGY.—A study of methods for the identification, control, and recording of essential variables in psychological situations, with emphasis upon the relation of experimental techniques to problem formulation. Laboratory, lectures, and discussions. 3 units. PROFESSOR KIMBLE

210. COGNITION AND HIGHER MENTAL PROCESSES.—An intensive analysis of the literature on thinking, problem-solving, creativity, language and related topics. Emphasis is upon the functional significance of these aspects of intellectual activity and upon the experimental methodology involved in their study. 3 units.

213, 214. CONDITIONING AND LEARNING.—A survey of the literature on classical and instrumental conditioning and other forms of simple learning. Emphasis is on classical conditioning in 213 and on instrumental behavior in 214. 3 to 6 units. PROFESSORS GUTTMAN AND KIMBLE

215. DEVELOPMENTAL PSYCHOLOGY.—A consideration of selected research areas in child behavior and development, including personality, cognition, perception and learning. 3 units. ASSOCIATE PROFESSOR BORSTELMANN

216. BIOLOGICAL PSYCHOLOGY.—The methods of biology (as applied to psychology), especially in neurophysiology, neuroanatomy and genetics. Topics covered include: (a) the genetics of behavior, (b) the organization of the dorsal thalamus and neocortex, (c) the limbic system and hypothalamus. Methods covered include: (a) ablation method, (b) method of evoked potentials, (c) electrical stimulation of the brain, (d) classical and physiological genetics. 3 units.
PROFESSOR DIAMOND

217. RESEARCH METHODS IN SOCIAL PSYCHOLOGY.—The theory and practice of data collection methods in social psychology. Emphasis is on the interplay between design and technique. The methods covered include formal scaling procedures, systematic observational techniques and others appropriate to field studies, field experiments, surveys and laboratory experiments. 3 units.
ASSOCIATE PROFESSOR BREHM

218. SOCIAL PSYCHOLOGY.—An examination of selected problem areas in social psychology including social factors in cognition, models of social interaction, conformity and social influence, and attitude development and change. Recent research is emphasized in relation to its historical context and its bearing on the development of theory. 3 units. PROFESSOR JONES

220. PHYSIOLOGICAL BASES OF BEHAVIOR.—Classical studies on the neuropsychology of learning and behaviors such as hunger, thirst and sex are examined. The central role of neuroendocrinology in providing an understanding of the physiological bases of motivated behavior is discussed. 3 units.

223. PSYCHOPHYSICS AND SENSORY SYSTEMS.—A consideration of the origins, concepts, and methods of psychophysics in conjunction with an examination of sensory systems, primarily hearing, as studied by psychophysical methods. 3 units.
LECTURER GREENWOOD

234. SEMINAR IN PERSONALITY.—A detailed consideration of selected research topics of current interest in the experimental study of personality, including risk-taking, creativity, and cognitive styles. 3 units. ASSOCIATE PROFESSOR WALLACH

236. THEORETICAL PSYCHOLOGY.—This course is devoted to the analysis of techniques of theory construction in psychology. The discussion of these methodological issues is co-ordinated with the analysis of concrete formulations in contemporary psychology theory. 3 units.

237. FUNCTIONAL NEUROPHYSIOLOGY.—This course considers the mechanisms of activity of the individual neuron and groups of nerve cells, the principles of activity of the afferent and efferent neural systems, and the integrative and associative functions of the nervous system. Laboratory demonstrations and participation. 3 units. ASSISTANT PROFESSOR ERICKSON

238. THE ELECTROENCEPHALOGRAM AND PSYCHOLOGICAL FUNCTION.—A survey of experimental and clinical literature on brain wave correlates of intelligence, personality, behavior disorders, epilepsy, sleep, sensory stimulation, conditioning and learning. Lectures, laboratory demonstrations, and clinical case presentations. 3 units. LECTURER OBRIST

239. BEHAVIORAL CORRELATES OF BRAIN DAMAGE IN MAN.—A study of the effects of brain damage on psychological functioning. Known brain-behavior relationships in man will be reviewed, and problems encountered in the study of brain function in man will be emphasized. Laboratory demonstrations will be concerned with the assessment of cerebral dysfunction through the use of standard psychological tests. 3 units. LECTURER THOMPSON

245, 246. PERSONALITY THEORY.—An examination of representative models

of human functioning from Freud to the present day. Included are examples from psychoanalytical, field theoretical, and behavioristic approaches. 3 units each semester. PROFESSOR ALEXANDER AND ASSISTANT PROFESSOR KREMEN

247, 248. PERSONALITY ASSESSMENT.—Introduction to the assessment of human personality through the study of personal documents, interview data, objective and projective test material. Laboratory sessions will be concerned with personality assessment of normal human subjects over extended time periods. 3 units each semester. PROFESSOR ALEXANDER AND ASSISTANT PROFESSOR KREMEN

253, 254. PERSONALITY DEVELOPMENT.—A survey of behaviors and concepts relating to personality functioning through the life span from infancy to old age. Laboratory sessions will involve the study of individuals in natural and experimental contexts by observation and testing. 3 units each semester.
ASSOCIATE PROFESSOR BORSTELMANN AND STAFF

265. FUNDAMENTAL STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—Introduction to probability and the use of statistics in description and hypothesis testing in psychology including the following applications: correlation techniques, chi-square and t tests, distribution-free tests and one-way analysis of variance. 3 units. ASSOCIATE PROFESSOR BONEAU

266. ADVANCED STATISTICAL APPLICATIONS IN PSYCHOLOGICAL RESEARCH.—The basic theory and applications of analysis of variance techniques to complex experimental designs will be covered. Additional advanced techniques, including factor analysis, will be introduced. Prerequisite: Psychology 265 or equivalent. 3 units. ASSOCIATE PROFESSOR BONEAU

271 a-d. SEMINAR IN SELECTED PROBLEMS.—3 units each.

273. PRINCIPLES OF PSYCHOLOGICAL MEASUREMENT.—Psychological measurement will be discussed in the context of the theoretical questions which motivate research, and the related demands of scientific inference. Topics will include methods of psychometric scaling and test construction, as well as selected methods for data analysis. Prerequisite: Psychology 265 or equivalent. 3 units.
ASSISTANT PROFESSOR SCHIFFMAN

282. INTRODUCTION TO METHODS IN PSYCHOTHERAPY.—Current trends in psychotherapeutic practice and research are discussed, as a means of introducing the student to the field. Emphasis is upon the application of principles drawn from theories of personality to individual and group psychotherapy. Discussions of selected readings and some field experience in therapy are included. 3 units. ASSOCIATE PROFESSOR LAKIN

292. THE HISTORY OF PSYCHOLOGY.—3 units. PROFESSOR ADAMS

FOR GRADUATES

305. PSYCHOPATHOLOGY.—An examination of behavior disorders, with particular emphasis on explanatory concepts and the evidence from research in this field. 3 units. LECTURER COHEN

306. SEMINAR IN DEVELOPMENT PSYCHOLOGY.—2 or 3 units.
PROFESSOR ADAMS

309. SEMINAR IN LEARNING.—3 units. PROFESSOR KIMBLE

310. SEMINAR IN PERCEPTION.—3 units.

311. SEMINAR IN INSTRUMENTAL BEHAVIOR.—3 units.
PROFESSOR GUTTMAN

312. SEMINAR IN THEORETICAL PSYCHOLOGY.—3 units.

316. SEMINAR IN SOCIAL PSYCHOLOGY.—3 units. PROFESSOR JONES

318. SEMINAR IN SOCIAL INFLUENCE.—3 units.
ASSOCIATE PROFESSOR BREHM

324. SEMINAR: BEHAVIORAL STUDIES OF THE BRAIN.—3 units.
PROFESSOR DIAMOND

335-336. CLINICAL PSYCHOLOGY PRACTICUM.—Seminar discussion and supervised field experience in the application of basic psychological procedures and

principles to clinical cases in a variety of institutional settings. Prerequisite: Psychology 245, 246, 247, and 248. 1 to 6 units each of two semesters. STAFF

337. SEMINAR IN SENSORY DISCRIMINATION.—A study of the neural bases of discrimination. 3 units. ASSISTANT PROFESSOR ERICKSON

341. PRINCIPLES OF PSYCHOTHERAPY, I.—Contributions from psychoanalysis, psychology, and social sciences will be reviewed to form a unified framework for understanding and treatment of behavior disorders. Emphasis on the problems characteristic of man living in society and culture and on principles of psychotherapy required by the human needs for consistency, self-esteem and self-realization. Selected case material will be used. Prerequisite: Psychology 282. 3 units. PROFESSOR DAI

342. PRINCIPLES OF PSYCHOTHERAPY, II.—Application of principles of psychotherapy in a detailed examination of interviews conducted by students. Emphasis on the role of therapist's personality in the therapy process and on problems of technique. Prerequisite: Psychology 341. 3 units. PROFESSOR DAI

343, 344. ADVANCED SEMINAR IN CLINICAL PSYCHOLOGY.—1 to 3 units each semester. STAFF

371. PRE-SCHOOL BEHAVIOR PROBLEMS.—The diagnostic evaluation of behavior development in infants and preschool children. The nature and causation of developmental anomalies. (Physical handicaps and social conditions in relation to intellectual and personality development.) Preventive and remedial measures. 3 units. ASSOCIATE PROFESSOR BANHAM

RELIGION

PROFESSOR BEACH, DIRECTOR OF GRADUATE STUDIES—209 DIVINITY SCHOOL; PROFESSORS ANDERSON, CLARK, CUSHMAN, HENRY, LACY, PETRY, PRICE, STINESPRING; ASSOCIATE PROFESSORS BAKER, GRISLIS, HERZOG, HILLERBRAND, OSBORN, SULLIVAN; ASSISTANT PROFESSORS LANGFORD, ROBINSON, STRUGNELL; LECTURER WINTERMUTE

The Department of Religion offers graduate work leading to the A.M. and Ph.D. degrees. Students may major in one of three fields: (1) Biblical Studies; (2) Historical Studies; and (3) Systematic and Contemporary Studies. They will be expected to take such courses in one or both of the other fields as will conduce to an adequate understanding of their chosen fields of specialization.

In addition to course work in these major fields, students will take such other courses in cognate fields as will contribute to the enrichment of their major studies.

This minor requirement may be fulfilled either by work in a cognate department, such as Ancient Language and Literature, History, or Political Science, or by work in a cognate field within the Department of Religion other than the field of major concentration.

The program of doctoral studies presumes a grounding in religion such as is normally derived from the course content of theoretical subjects of a seminary curriculum. Candidates for admission to the doctoral program are favored, therefore, who hold a B.D. degree from an accredited seminary or who have had at least two years of seminary study beyond the B.A. degree. Students applying for graduate work in religion directly from an undergraduate program should have had a strong undergraduate major in religion, and will be accepted for the Ph.D. program only on the condition of satisfactory completion of the M.A. degree with the department.

Candidates for the Ph.D. degree must complete the language requirements in both French and German not later than the beginning of the second year of residence.

FIELD I. BIBLICAL STUDIES

201-202. FIRST HEBREW.—The principles and structure of the Hebrew language with translation of selected Old Testament narratives. 6 units.
PROFESSOR STINESPRING

207. SECOND HEBREW.—Historical Hebrew grammar with reading and exegesis of Old Testament prose (the Pentateuch and historical books in alternate years). First semester. 3 units. STAFF

208. SECOND HEBREW.—Historical Hebrew grammar with reading of Old Testament poetry (the Prophets and the Writings in alternate years). Second semester. 3 units. STAFF

209. BIBLICAL THEOLOGY.—A study of the Old and New Testaments in regard to their theological relationship. 3 units. PROFESSOR ANDERSON

226. EXEGESIS OF THE GREEK NEW TESTAMENT I.—A. Mark and Matthew; B. Romans; C. Colossians and Ephesians. (N.T. 226 A, N.T. 226 B, and N.T. 226 C are separate courses, offered in different semesters.) 3 units. PROFESSOR PRICE

227. EXEGESIS OF THE GREEK NEW TESTAMENT II.—A. Luke-Acts; B. Galations and I Corinthians; C. The Pastoral Epistles; D. The Apocalypse. (N.T. 227 A, N.T. 227 B, N.T. 227 C, N.T. 227 D are separate courses, offered in difierent semesters.) 3 units. PROFESSOR ANDERSON

228. THE THEOLOGY OF THE GOSPEL AND EPISTLES OF JOHN.—A study of the origin of these writings; the provenance of their thought forms and symbolism; their influence on the early church; and contemporary significance. 3 units. PROFESSOR PRICE

301. THE THEOLOGY OF THE DEAD SEA SCROLLS.—A study of the religious ideas of the Scrolls in relation to the theology of the Old and New Testaments. 3 units. ASSISTANT PROFESSOR STRUGNELL

302. STUDIES IN THE INTERTESTAMENTAL LITERATURE.—Selected documents of the Apocrypha and Pseudepigrapha examined exegetically and theologically in their relation to Post-Exilic Judaism. Prerequisite: Permission of the instructor. 3 units. PROFESSOR ANDERSON

304. ARAMAIC.—A study of the Aramaic portions of the Old Testament, and selected passages from the Targums, Midrashes, and Talmuds. 3 units. PROFESSOR STINESPRING AND ASSISTANT PROFESSOR STRUGNELL

305. THIRD HEBREW.—An interpretative study of late Hebrew prose, with readings from Chronicles, Ecclesiastes, and the Mishnah. 3 units. PROFESSOR STINESPRING

306. LANGUAGE AND LITERATURE OF THE DEAD SEA SCROLLS.—A study in interpretation. Prerequisite, a knowledge of Hebrew. 3 units. ASSISTANT PROFESSOR STRUGNELL

307. SYRIAC.—A study of the script and grammar, with readings from the Syriac New Testament and other early Christian documents. Some knowledge of Hebrew and Aramaic prerequisite. 3 units. PROFESSOR STINESPRING

309. HISTORY OF THE ANCIENT NEAR EAST.—A specialized study of the civilizations of Egypt, Palestine, Syria, and Mesopotamia in the light of Biblical archaeology. 3 units. PROFESSOR STINESPRING

310. OLD TESTAMENT PROPHECY.—The prophetic movement in Israel with special emphasis on the theological standpoint of the prophets of the eighth century B.C. 3 units. PROFESSOR STINESPRING

318. TEXTUAL CRITICISM OF THE NEW TESTAMENT.—A study of the scientific recovery of the Greek text on which modern versions are based; manuscript discoveries; principles of textual criticism; practice in collating original manuscripts in the Duke collection. 3 units. PROFESSOR CLARK

340-341. SEMINAR IN THE NEW TESTAMENT.—Research and discussion on a selected problem in the Biblical field. 2 units. PROFESSORS ANDERSON AND PRICE

FIELD II. HISTORICAL STUDIES

234. THE THEOLOGY OF THOMAS AQUINAS.—A systematic interpretation of the thought of Aquinas, with a major emphasis on his specifically theological formulations, drawing upon the *Summa Theologica* and other relevant sources. 3 units. ASSOCIATE PROFESSOR GRISLIS

240. THE THEOLOGY OF RICHARD HOOKER.—An exposition of the writings of the systematic theologian of Anglicanism in the sixteenth century. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR GRISLIS

250. STUDIES IN MODERN CHURCH HISTORY, I. REFORMATION AND COUNTER-REFORMATION.—History and thought of European Christianity between 1517-1680. (Also listed as History 225.) 3 units.
ASSOCIATE PROFESSOR HILLERBRAND

251. STUDIES IN MODERN CHURCH HISTORY, II: PIETISM AND RATIONALISM.—History and thought of Christianity on the continent of Europe between 1680-1800. 3 units. ASSOCIATE PROFESSOR HILLERBRAND

260. SEMINAR: WESLEY STUDIES.—The lives and thought of John and Charles Wesley and their colleagues in relation to English culture and religion in the 18th century. 3 units. ASSOCIATE PROFESSOR BAKER

279. RELIGIONS OF EAST ASIA.—A study of the major traditions of China and Japan with emphasis on the development and expansion of Buddhism. 3 units.
ASSOCIATE PROFESSOR SULLIVAN

280. THE HISTORY OF RELIGIONS.—A study of the methodology of the history of religions, the nature of religious experience, and specific categories of religious phenomena. 3 units. ASSOCIATE PROFESSOR SULLIVAN

285. ORIGINS OF INDIAN CIVILIZATION.—A study of the main sources and traditions of the classical civilization of the Indian sub-continent, with particular attention to religious movements and institutions. (Also listed as History 285.) 3 units. ASSOCIATE PROFESSOR SULLIVAN

296. RELIGION ON THE AMERICAN FRONTIER.—A study of the spread of evangelical Christianity as a theological and cultural phenomenon of the American West. 3 units. PROFESSOR HENRY

322. NINETEENTH-CENTURY EUROPEAN THEOLOGY.—Protestant theology from Kant to Herrman together with representative British theologians. 3 units.
ASSOCIATE PROFESSOR HERZOG

331. THE SOCIAL MESSAGE OF THE EARLY AND MEDIEVAL CHURCH. A study of the social teachings and contributions of the Christian Church prior to the Protestant Reformation. 3 units. PROFESSOR PETRY

332. THE MEDIEVAL CHURCH.—Outstanding characteristics of the Medieval Church, emphasizing theory, polity, institutions, sacraments, and worship. 3 units. (Not 1965-66) PROFESSOR PETRY

334. CHURCH REFORMERS AND CHRISTIAN UNITY.—The work of such reformers as Marsilius of Padua, William Ockham, Jean Gerson, Pierre d'Ailly, and Nicholas of Cusa in relation to ecclesiastical schism and the search for Christian unity through representative councils. 3 units. PROFESSOR PETRY

336. CHRISTIAN MYSTICISM IN THE MIDDLE AGES.—Source studies in historical perspective of such late medieval mystics as Bernard of Clairvaux, the Victorines, Ramon Lull, Meister Eckhart, Richard Rolle, Catherine of Siena, and Nicholas of Cusa. 3 units. (Not 1965-66) PROFESSOR PETRY

337. THE THEOLOGY OF MARTIN LUTHER.—A critical and comparative examination of Luther's thought. 3 units. ASSOCIATE PROFESSOR HILLERBRAND

338. THE THEOLOGY OF JOHN CALVIN.—An exposition of the *Institutes of the Christian Religion* in relation to cognate documents. 3 units. (Not 1965-66)
ASSOCIATE PROFESSOR GRISLIS

339. LEFT-WING MOVEMENTS OF THE REFORMATION.—A survey of the history and theology of the "radical" Reformation. 3 units.
ASSOCIATE PROFESSOR HILLERBRAND

387. CHRISTIAN ETHICS AND SOCIAL PHILOSOPHY.—Selected social philosophies from Locke to Sumner analyzed from the standpoint of Christian ethics. 3 units. PROFESSOR LACY

391. HISTORICAL TYPES OF CHRISTIAN ETHICS I.—A critical study of representative statements of Christian ethical theory, through the early Reformation. 3 units. PROFESSOR BEACH

392. HISTORICAL TYPES OF CHRISTIAN ETHICS II.—A continuation of C.E. 391, from the Reformation through current Christian ethical theory. Prerequisite: C.E. 391. 3 units. PROFESSOR BEACH

395. CHRISTIAN THOUGHT IN COLONIAL AMERICA.—Exposition of the main currents in Protestant theology. 3 units. PROFESSOR HENRY

396. LIBERAL TRADITIONS IN AMERICAN THEOLOGY.—A study of the main types of modern religious thought, beginning with the theology of the Enlightenment. 3 units. PROFESSOR HENRY

FIELD III. SYSTEMATIC AND CONTEMPORARY STUDIES

210. BRITISH THEOLOGY.—A study of twentieth-century British Theology. Attention will be given to the Anglican, Free Church, and Scottish traditions. 3 units. ASSISTANT PROFESSOR LANGFORD

230. THE MEANING OF RELIGIOUS LANGUAGE.—An analysis of the credentials of some typical claims of theism in the light of theories of meaning in recent thought. 3 units. (Also listed as Philosophy 230)
ASSOCIATE PROFESSOR POTEAT

231. SEMINAR IN CHRISTIANITY AND CONTEMPORARY THOUGHT.—Analytical reading and discussion of such critical cultural analysis as is found in the works of M. Polanyi, Arendt, Trilling, and others, with appraisal of the relevance for theological inquiry. 3 units. ASSOCIATE PROFESSOR POTEAT

248. THE THEOLOGY OF KARL BARTH.—An historical and critical study of the theology of Karl Barth. 3 units. ASSOCIATE PROFESSOR OSBORN

292. CHRISTIAN ETHICS AND INTERNATIONAL RELATIONS.—An examination of Christian attitudes toward such issues as war and peace, the rule of law, foreign aid, and human rights; and the Church's contribution to international policies and institutions. 3 units. PROFESSOR LACY

303. DOGMA AND THE PROBLEM OF HISTORY.—The authority of Kerygma and the Word of God in contemporary European theology. 3 units.
ASSOCIATE PROFESSOR HERZOG

320. SEMINAR: SCHLEIERMACHER.—A critical examination of the dogmatic system. 3 units. ASSOCIATE PROFESSOR HERZOG

325. PHILOSOPHICAL THEOLOGY I.—Main problems in the history of philosophical theology. 3 units.
ASSISTANT PROFESSOR ROBINSON OR PROFESSOR CUSHMAN

326. PHILOSOPHICAL THEOLOGY II.—Prolegomena to the system of Christian theology. 3 units. ASSISTANT PROFESSOR ROBINSON OR PROFESSOR CUSHMAN

328. TWENTIETH-CENTURY EUROPEAN THEOLOGY.—Critical examination of the thought of selected representative theologians. 3 units. (Not 1965-66)
ASSOCIATE PROFESSOR HERZOG

333. SEMINAR: MARXIST IDEOLOGY AND CHRISTIAN FAITH.—Comparative study of Communist and Christian doctrines of man, society, sin, history, ethics, and eschatology. 3 units. PROFESSOR LACY

380. EXISTENTIALISM.—An exploration of the interests and motifs of Existentialism in relation to modern philosophy and theology through an analysis of representative writings of Kierkegaard, Heidegger, Berdyaev, Marcel, and Sartre. 3 units. ASSOCIATE PROFESSOR POTEAT

385. RELIGION IN AMERICAN LITERATURE.—A critical study of the meaning and value of religious motifs reflected in American literature. 3 units.
PROFESSOR HENRY

386. SEMINAR: THEOLOGICAL TRENDS IN THE WORLD CHURCH.—Contemporary currents of Christian thoughts as they affect resurgent non-Christian faiths, new formulations of a theology of mission, and ecumenical conversations. 3 units. PROFESSOR LACY

389. CHRISTIAN ETHICS AND CONTEMPORARY CULTURE.—A study of the interaction between Christian thought and current secular social theory. 3 units. (Not 1965-66) PROFESSOR BEACH

390. CURRENT PROBLEMS IN CHRISTIAN ETHICAL THEORY.—A critical study of dominant issues in Christian ethics, through an analysis of a variety of contemporary Christian treatments of such problems as love, justice, community, and vocation. 3 units. PROFESSOR BEACH

394. CHRISTIANITY AND THE STATE.—The relation of the Christian theory of the State to political problems, with special consideration of the religious assumptions underlying democratic theory and practice and of the relationship of church to state. 3 units. (Not 1965-66) PROFESSOR BEACH

397. CONTEMPORARY AMERICAN THEOLOGY.—Critical appraisal of major tendencies. 3 units. PROFESSOR HENRY

398. COLLOQUIUM ON THE COLLEGE AND UNIVERSITY TEACHING OF RELIGION.—The theological issues of religion in higher education; a consideration of the curricular content of religion courses. Normally expected of Level III students in Fields I, II, and III in residence. PROFESSOR BEACH AND STAFF

ROMANCE LANGUAGES

PROFESSOR FEIN, CHAIRMAN—205 FOREIGN LANG.; PROFESSOR CHERPACK, DIRECTOR OF GRADUATE STUDIES—310 FOREIGN LANG.; PROFESSORS CASTELLANO, DAVIS, DOW, FOWLIE, PREDMORE, AND WARDROPPER; ASSOCIATE PROFESSORS CORDLE, GRANT, AND VINCENT; ASSISTANT PROFESSORS BUSH, HULL, AND TETEL

The Department of Romance Languages offers graduate work leading to the A.M. and Ph.D. degrees. In order to undertake graduate study in this Department, the student should normally have credit for four years of college courses in the chosen language, or 18 semester hours beyond the conventional two units offered at entrance to college. In addition to this minimum requirement, the student should have had one semester of review in composition and grammar.

It is recommended that candidates for the A.M. degree take a second Romance language as the minor subject.

A candidate for the Ph.D. degree will be required to take some training in Romance linguistics, the amount to be determined by the Department upon consideration of the student's preparation in the field, and a course in the methods of literary scholarship.

FRENCH

FOR SENIORS AND GRADUATES

209. ADVANCED COMPOSITION AND SYNTAX.—A detailed study of the morphological and syntactic structure of the French language; practice in writing various styles of French; vocabulary study. 3 units. ASSISTANT PROFESSOR HULL

210. FRENCH PHONETICS.—The phonemic structure of contemporary French. Sounds, intonation. Practice transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied to French. 3 units. ASSISTANT PROFESSOR HULL

213. FRENCH CLASSICISM.—Its initial phase. Reading from Malherbe, Balzac, Voiture, Descartes, Corneille, Molière, and others. 3 units. (1965-66) PROFESSOR CHERPACK

214. FRENCH CLASSICISM.—Its maturity. Readings from Pascal, Racine, La Fontaine, La Rochefoucauld, Boileau, Bossuet, Madame de Sévigné, La Bruyére, Saint-Simon, and others. 3 units. (1965-66) PROFESSOR CHERPACK

217. MALLARMÉ AND RIMBAUD.—The symbolism and the formal elements in Mallarmé's poetry. The poetic theory and the psychic elements in Rimbaud's poetry. 3 units. (Not 1965-66) PROFESSOR FOWLIE

219. OLD FRENCH LITERATURE.—An introduction to the reading of Old French literary texts. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR VINCENT

221. THE NINETEENTH-CENTURY FRENCH NOVEL.—Its initial phase. The Romantic hero in conflict with society, with special emphasis on the works of Stendhal and Balzac. 3 units. (1965-66) ASSOCIATE PROFESSOR GRANT

222. THE NINETEENTH-CENTURY FRENCH NOVEL.—Its continuation. The decline of the individual hero. Flaubert and Zola will receive intensive study. 3 units. (1965-66) ASSOCIATE PROFESSOR GRANT

223. FRENCH LITERARY CRITICISM.—A history of critical theory in France and a study of the major critics from the Renaissance to today. 3 units. (Not 1965-66) PROFESSOR FOWLIE

225, 226. FROM RENAISSANCE TO BAROQUE IN FRENCH LITERATURE OF THE SIXTEENTH CENTURY.—First semester: Literary prose. Readings from Jean Lemaire de Belges, Marguerite de Navarre, Rabelais, Montaigne, and others. Second semester: Poetry and theater. Readings from Marot, Scève, Labé, Saint Gelais, the Pléiade, d'Aubigné, Sponde, Du Bartas, Garnier, and others. (1965-66) ASSISTANT PROFESSOR TETEL

228. FRENCH POETRY OF THE TWENTIETH CENTURY.—In the wake of symbolism: Valéry and Claudel; poetry as ritual; Péguy; Apollinaire and surrealist poetry; the contemporary movement: Michaux, Char, Saint-John Perse. 3 units. (Not 1965-66) PROFESSOR FOWLIE

233. CONTEMPORARY FRENCH THEATER.—A study of dramatic theory; the art of the leading directors; and the major texts of Claudel, Giraudoux, Anouilh, Sartre, Beckett, Ionesco, Genet, etc. 3 units. (1965-66) PROFESSOR FOWLIE

234. PROUST.—A study of *A la recherche du temps perdu*. The thematic structure and the aesthetics of the work. 3 units. (Not 1965-66) PROFESSOR FOWLIE

236. BAUDELAIRE.—A study of the poetry and the criticism of Baudelaire as contributing to the origins of modern art and literature. 3 units. (Not 1965-66) PROFESSOR FOWLIE

241, 242. FRENCH LITERATURE AND THOUGHT IN THE AGE OF ENLIGHTENMENT.—First semester: The new philosophy and its propagation. Lectures and discussions involving texts by Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and others. Second semester: The crisis in literary aesthetics. Readings, lectures, and discussions bearing on the clash between Classicism and new literary orientations. 6 units. (1965-66) PROFESSOR CHERPACK

245. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—1895-1925: The metamorphoses of symbolism. A study of the works of Proust, Gide, and Claudel. 3 units. (1965-66) ASSOCIATE PROFESSOR CORDLE

246. FRENCH LITERATURE OF THE TWENTIETH CENTURY.—1925-1955: The existentialist conversion. A study of the work of Malraux, Sartre, Camus. 3 units. (Not 1965-66) ASSOCIATE PROFESSOR CORDLE

248. FRENCH LITERATURE OF THE TWENTIETH CENTURY: THREE MODERN PROPHETS.—Extensive reading from Bloy, Péguy, Bernanos. 3 units. (Not 1965-66) ASSISTANT PROFESSOR BUSH

FOR GRADUATES

311, 312. FRENCH SEMINAR.—Each semester one of the following topics will be selected for intensive treatment: (a) Studies in Sixteenth-Century Literature, (b) Studies in Eighteenth-Century Literature, (c) Studies in Nineteenth-Century Literature, (d) Studies in Seventeenth-Century French Literature, (e) Studies in Contemporary Literature. 3 units each semester.

PROFESSORS CHERPACK AND FOWLIE; ASSOCIATE PROFESSORS CORDLE AND GRANT; ASSISTANT PROFESSOR BUSH AND TETEL

—.GRADUATE READING COURSE. An intensive course in French to develop rapidly the ability to read French in several fields. Graduate students only. No credit.

ITALIAN

FOR SENIORS AND GRADUATES

288. THE RENAISSANCE.—Petrarch, Boccaccio, and Ariosto. 3 units. ASSISTANT PROFESSOR TETEL

SPANISH

FOR SENIORS AND GRADUATES

251. THE ORIGINS OF THE SPANISH NOVEL.—A critical study, based on close readings and discussions, of selected examples of the principal genres of the early novel: the *Amadis de Gaula, Diego de San Pedro's La cárcel de amor,* the *Abencerraje,* the *Lazarillo,* Montemayor's *Diana.* 3 units. (Not 1965-66)
PROFESSOR WARDROPPER

252. SPANISH LYRIC POETRY BEFORE 1700.—A critical study, based on close reading and discussion, of selected poems of the Middle Ages, Renaissance and Baroque. Special emphasis on the *Razón de amor, la poesía de tipo tradicional,* and Santillana; on Garcilaso, San Juan de la Cruz, Fray Luis de León, and Herrera; on Góngora and Quevedo. 3 units. (1965-66) PROFESSOR WARDROPPER

253. THE ORIGINS OF THE SPANISH THEATER.—A study of the evolution of the Spanish theater from the *Auto de los Reyes Magos* (12th century) through the end of the 16th century. The idea of the theater as dramatic poetry will be stressed; close reading of texts by Gómez Manrique, Encina, Gil Vicente, Torres Naharro, Lope de Rueda, Juan de la Cueva. 3 units. (Not 1965-66)
PROFESSOR WARDROPPER

255. MODERN LATIN-AMERICAN LITERATURE.—The coming of age of Latin-American literature in the nineteenth and twentieth centuries, with particular attention to the Modernist movement. 3 units. (Not 1965-66) PROFESSOR FEIN

256. CONTEMPORARY LATIN-AMERICAN LITERATURE.—Trends in Latin-American literature after the Modernist movement. Analysis of significant works in various genres. 3 units. (1965-66) PROFESSOR FEIN

258. OLD SPANISH LITERATURE.—An introduction to the reading of Old Spanish literary texts. 3 units. (1965-66) PROFESSOR DAVIS

259. SPANISH PHONETICS.—A phonemic approach to the study of Spanish sounds. Remedial pronunciation drills with special emphasis on rhythm and intonation. Readings in current studies of phonology. 3 units.
PROFESSOR CASTELLANO

260. ADVANCED COMPOSITION AND SYNTAX.—Study of fundamental difficulties in the language; practice in writing idiomatic Spanish; exercises in free composition. For students who have a satisfactory command of Spanish grammar and fair conversational ability. 3 units. PROFESSOR CASTELLANO

261. NINETEENTH-CENTURY NOVEL.—A study of literary and social trends in the last half of the nineteenth century. Readings will be selected from the novels of Valera, Pereda, Galdós, Pardo, Barzán, Blasco Ibánez, and their contemporaries. 3 units. (Not 1965-66) PROFESSOR DAVIS

264. MODERN AND CONTEMPORARY SPANISH THEATER.—A brief review of modern and contemporary Spanish theater from the period of Romanticism. Lectures, reading and discussion of the most representative works of Benavente, los hermanos Quintero, Garcia Lorca, Casona, etc. 3 units. (1965-66)
PROFESSOR CASTELLANO

265. GOLDEN AGE LITERATURE: CERVANTES.—The life and works of Cervantes with special emphasis on his *Quijote.* 3 units. PROFESSOR PREDMORE

266. GOLDEN AGE LITERATURE: THE DRAMA.—Study of the chief Spanish dramatists of the seventeenth century with readings of representative plays of this period. 3 units. (1965-66) PROFESSOR CASTELLANO

275. CONTEMPORARY SPANISH LITERATURE.—The essay and lyric poetry. A study of the revision of national values and literary expression in the twentieth century with particular reference to the crisis of 1898 and to the enrichment of the Spanish tradition through extra-peninsular influences. 3 units. (Not 1965-66)
PROFESSOR PREDMORE

276. CONTEMPORARY SPANISH LITERATURE.—The novel. A study of tradition and innovation in the twentieth-century Spanish novel with emphasis on the novels of Unamuno, Baroja, Valle Inclán, and Pérez de Ayala. 3 units. (1965-66) PROFESSOR PREDMORE

FOR GRADUATES

321, 322. HISPANIC SEMINAR.—Each semester one of the following topics will be selected for intensive treatment: (a) The Spanish Language in America, (b) Studies in Medieval Literature, (c) Studies in the Literature of the Golden Age, (d) Studies in Latin American Literature, (e) Studies in the Spanish Renaissance and Baroque, (f) Studies in Spanish Poetry, (g) Studies in Nineteenth-Century Spanish Literature. 3 units each semester.

PROFESSORS CASTELLANO, DAVIS, FEIN, PREDMORE, AND WARDROPPER

ROMANCE LANGUAGES

211. APPROACHES TO ROMANCE LITERATURE.—An introduction to the most significant ways in which Romance literature has been divided and studied, with analyses of selected texts. 3 units. PROFESSOR CHERPACK

218. THE TEACHING OF ROMANCE LANGUAGES.—Evaluation of objectives and methods; a study of the practical problems involved in teaching these languages on the elementary, secondary, and college levels; analysis of textbooks, special foreign language programs, audio-visual aids; critical examination of modern techniques in written and oral testing. 3 units. PROFESSOR DOW

224. ROMANCE LINGUISTICS.—The origin and development of the Romance languages from spoken Latin to the modern standard languages and local dialects. Introduction to contemporary methods in historical and comparative linguistics. 3 units. ASSISTANT PROFESSOR HULL

RUSSIAN

ASSOCIATE PROFESSOR JEZIERSKI

No graduate degree is presently offered in Russian. The following courses may serve in the minor programs of students in other departments.

201, 202. THE NOVELISTS OF NINETEENTH-CENTURY RUSSIA.—Development of the Russian novel against the European background, with emphasis on Dostoevskij and Tolstoj. Extensive readings in English. Lectures, oral reports, class discussions, and term paper. 6 units. ASSOCIATE PROFESSOR JEZIERSKI

SOCIOLOGY AND ANTHROPOLOGY

PROFESSOR MCKINNEY, CHAIRMAN—2681 BUILDING #9; PROFESSOR KERCKHOFF, DIRECTOR OF GRADUATE STUDIES—271 BUILDING #9; PROFESSORS BACK, LA BARRE, MADDOX, AND THOMPSON; ASSOCIATE PROFESSORS MCCORMACK, PREISS, ROWE, ROY, AND SMITH; ASSISTANT PROFESSOR WINSBOROUGH

The Department offers graduate work leading to the A.M. and Ph.D. degrees in Sociology. Before undertaking advanced work in this department, a student must have completed a minimum of twelve semester hours of approved preliminary courses in the field, and twelve additional semester hours in the field or in related work. Applicants for admission should submit scores on the Graduate Record Examination, especially the Aptitude Test.

Before being admitted to candidacy for the Ph.D. degree, an applicant is normally expected to have qualified for the A.M. degree. Candidates for the Ph.D. degree are expected to have a broad background in the various aspects of sociology—substantive, theoretical, and empirical. The program of each candidate is determined by a committee which reviews his previous work and sets the specific requirements to be met. These requirements will include work in related fields such as psychology, philosophy, mathematics, economics, or political science. Emphasis is placed on the completion of the dissertation, directed by a member of the staff, demonstrating competence and independence in the investigation of an original and significant problem.

Further details of the program, the departmental facilities, the staff, and various stipends available are described in a brochure which may be obtained from the Director of Graduate Studies in Sociology.

FOR SENIORS AND GRADUATES

230. SOCIETY AND CULTURE IN INDIA.—The basic features of Indian cultures and societies from an anthropological perspective. The impact of selected technological and social changes upon the individual, caste and community. 3 units. ASSOCIATE PROFESSOR ROWE

232. PRIMITIVE RELIGION.—The ethnography, the social functions, and the socio-psychological meanings of religion in primitive societies. 3 units. PROFESSOR LA BARRE

234. PERSONALITY AND SOCIETY.—The sociology and social psychology of human personality, its origins in the primary group, its nature and varieties and its integrations into secondary group institutions. 3 units. PROFESSOR LA BARRE

236. PERSONALITY AND CULTURE.—The influence of culture patterns and social institutions upon character structure, socialization of the individual, and the dynamics of human personality. Comprehensive anthropological materials will be drawn upon. Prerequisite: Course 234. 3 units. PROFESSOR LA BARRE

238. LANGUAGE AND SOCIETY.—An introduction to the study of language and society. Universal features of language, language as a mirror of society and social perception through language, language as a coding system, linguistics and anthropology, applied linguistics. 3 units. ASSOCIATE PROFESSOR MCCORMACK

241. SOCIAL STRATIFICATION.—The nature of hierarchical and vertical differentiation in the economic, political and prestige structures in modern societies. The interrelationship of class, status and power strata and their influence on social institutions, personality structure, and group and individual behavior. 3 units. ASSOCIATE PROFESSOR ROY

242. THE SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS.—The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 3 units. PROFESSOR MCKINNEY AND ASSOCIATE PROFESSOR ROY

243. POPULATION DYNAMICS AND SOCIAL CHANGE.—The aim of this course is to introduce the student to the facts and techniques of demographic analysis, and to provide an understanding of the relationship between the demographic structure of society and its social organization. 3 units. ASSISTANT PROFESSOR WINSBOROUGH

245. DEVIANT SOCIAL BEHAVIOR.—Analysis of deviant behavioral systems (illness, crime, delinquency, etc.) in terms of a) precipitating social factors, b) patterns and goals, c) remedial and counteracting controls. 3 units. ASSOCIATE PROFESSOR PREISS

247. COMMUNITY AND SOCIETY.—This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, news, mass behavior, social problems, races and classes. 3 units. PROFESSOR THOMPSON

253. SOCIAL INSTITUTIONS.—The study of particular institutions and the social movements out of which they developed, with emphasis on the development of general propositions concerning the nature, function and importance of institutions in society. 3 units. PROFESSOR THOMPSON

255. RACE AND CULTURE.—A comparative study of race relations in world perspective developed around such themes as races and personal identity, the geography and ecology of race relations, the idea of race, and race conflict. 3 units. PROFESSOR THOMPSON

272. THE SOCIALIZATION PROCESS.—A consideration of the universal societal requirement for replacement of socialized personnel with major concentration on the process in Western society. Particular attention is given to variations in socialization by position in the social structure (class, caste, urban-rural, etc.) and to the contributions made by various socialization agencies (family, school, peer groups, mass media). 3 units. PROFESSOR KERCKHOFF

275. SOCIAL ATTITUDES AND INDIVIDUAL BEHAVIOR.—Such issues as

the following are considered: the importance of symbolic interaction, the development of the "self," the social structuring of the socialization process, individual movement within the social structure, and the importance of membership groups and reference groups. 3 units. PROFESSORS BACK AND KERCKHOFF

278. SOCIAL STRUCTURE AND THE LIFE CYCLE.—A study of the relationship between age as a social characteristic and social interaction, with particular reference to adolescence and old age. 3 units. PROFESSOR MADDOX

281. DEVELOPMENT OF SOCIOLOGICAL THEORY.—An analysis of the development, convergence and utilization of sociological theory. Prerequisite: 15 s.h. credit in sociology. 3 units. PROFESSOR MCKINNEY AND ASSOCIATE PROFESSOR PREISS

282. PRINCIPLES OF SOCIOLOGICAL ANALYSIS.—An advanced course in general sociology designed to give a systematic conception of social order, focusing on its structural components and the functions they serve. Undergraduates must have at least 15 s.h. and a B average in sociology and have the permission of the instructor. 3 units.* PROFESSOR THOMPSON

295. METHODOLOGY IN SOCIOLOGY.—Considerations of the nature of scientific method, as well as alternative paths to knowledge, as they apply to sociology. Conceptualization, hypothesis formation, and definition. The research process as a decision-making situation both on the general level of research design and the specific level of special techniques. The process and logic of data analysis. Relations of theory and research are stressed. 3 units. ASSOCIATE PROFESSOR SMITH

297. STATISTICAL ANALYSIS IN SOCIOLOGY.—Such techniques as zero and higher order linear and curvilinear correlation, partial correlation, analysis of variance and covariance and factorial design are studied. Where possible, analogous non-parametric techniques are also considered. Prerequisite: Mathematics 233 or an equivalent course. Undergraduates must have at least 15 s.h., a B average in sociology and obtain the permission of the instructor. 3 units.
ASSISTANT PROFESSOR WINSBOROUGH

FOR GRADUATES

330. SEMINAR IN ANTHROPOLOGY.—A seminar for advanced students who wish to pursue individual studies in racial and cultural anthropology. Offered both semesters. 1 to 3 units each semester. PROFESSOR LA BARRE AND ASSOCIATE PROFESSORS MCCORMICK AND ROWE

341. SPECIAL PROBLEMS OF COMPLEX SYSTEMS.*

(a) INDUSTRIAL AND PROFESSIONAL SYSTEMS.—Analysis of problems of organization of work in such diverse settings as industrial plants, hospitals, and public administration groups. Problems of decision-making, recruitment, allocation of authority, informal organization, interorganizational relations. 3 units.
PROFESSOR MCKINNEY AND ASSOCIATE PROFESSOR ROY

(b) MASS COMMUNICATIONS.—Theoretical problems in defining and distinguishing communication, communicative acts, communication processes, and communication systems. Work aimed toward the derivation of models and theories for each of these will be pursued. Students must have permission of the instructor or have had at least 6 units in some of the following courses: 142, 171, 172, 275, 373, 374. 3 units. ASSOCIATE PROFESSOR SMITH

(c) URBAN SOCIETY.—Analysis is made of the varying mechanisms through which urban society is integrated, how urbanites develop a sense of identification with the community, and the extent and mode of social dominance of the city in the larger society. 3 units. PROFESSOR THOMPSON AND ASSOCIATE PROFESSOR SMITH

(d) HUMAN ECOLOGY.—An examination of such issues as: the logic and utility of the ecological approach; the possibility of testing current ecological theories in non-western, non-urban environment; alternative explanations for the spatial patterning of social phenomena; selected methodological problems. 3 units.
PROFESSOR THOMPSON, ASSOCIATE PROFESSOR SMITH, AND ASSISTANT PROFESSOR WINSBOROUGH

351, 352. SEMINAR IN SOCIAL ORGANIZATION.—Examination of such prob-

lems as the bases of social cohesion and continuity, the sources and effectiveness of social control mechanisms, the problem of social change in structural-functional theory. 3 units each semester.

PROFESSORS MADDOX, MCKINNEY, AND THOMPSON

373, 374. SOCIAL PSYCHOLOGICAL ISSUES IN SOCIOLOGY.—Detailed exploration of selected problem areas such as the theory and measurement of social attitudes, role discontinuity and personality disorders, applications of reference group theory, the socialization process. Students must have permission of the instructor or have had at least 6 units in some of the following courses: 142, 171, 172, 275, 341b. 3 units each semester. PROFESSORS BACK AND KERCKHOFF

385, 386. SEMINAR IN SOCIOLOGICAL THEORY.—Detailed analysis of methodological and substantive problems in utilizing comprehensive, middle-range, and discrete theories in varied sociological areas. Major emphasis on the use of theory in empirical research. Open to students who have had 281 or its equivalent. 3 units each semester. PROFESSORS MCKINNEY AND THOMPSON; ASSOCIATE PROFESSOR PREISS

392. INDIVIDUAL RESEARCH IN SOCIOLOGY.—Students will conduct on an individual basis research designed to evaluate a sociological hypothesis of their choice. The process must be completely by preparation of a report on this research in adequate professional style. Prerequisite: Sociology 295 or permission of the instructor. 3 units each semester. PROFESSORS BACK AND KERCKHOFF, AND ASSOCIATE PROFESSOR SMITH

397, 398. SEMINAR IN SPECIAL RESEARCH PROBLEMS.—Treatment in depth of either selected methodological issues and/or methods. Examples of possible topics include scaling, methods of machine data processing, validation and induction, quantification, interviewing, measurement, sampling plans, development of research designs from statistical models, methodological research, experimental techniques, the relation of theory to research, and the role of statistical methods in sociology. Open to students by permission of the instructor. 3 units each semester.* PROFESSOR BACK, ASSOCIATE PROFESSOR SMITH, ASSISTANT PROFESSOR WINSBOROUGH

410. SEMINAR IN THE GOVERNMENT, HISTORY, AND SOCIAL STRUCTURE OF INDIA AND PAKISTAN. 3 units.*

ASSOCIATE PROFESSORS MCCORMICK, ROWE, AND ASSOCIATES

ZOOLOGY

PROFESSOR HORN, CHAIRMAN, 227 BIOLOGICAL SCIENCES BUILDING; ASSOCIATE PROFESSOR LIVINGSTONE, DIRECTOR OF GRADUATE STUDIES, 042 BIOLOGICAL SCIENCES BUILDING; PROFESSORS BOOKHOUT, GRAY, GREGG, HUGHES-SCHRADER, MENZIES, SCHMIDT-NIELSEN, WILBUR; ADJUNCT PROFESSOR STEFANSSON; ASSOCIATE PROFESSORS BAILEY, FLUKE, HUNTER, KLOPFER, VERNBERG, WAINWRIGHT, WARD; ASSISTANT PROFESSORS COSTLOW, TUCKER

To undertake study toward an advanced degree in zoology, a student should have completed an undergraduate major in zoology or its equivalent. This normally amounts to 24 or more hours of course work distributed among various fields of zoology. The department recognizes the trend in modern biology towards interdisciplinary research and part of the zoology requirements may be replaced by advanced work in chemistry, mathematics, physics, etc.

Required work for the A.M. degree ordinarily includes 12 units of advanced course work in zoology, 6 units of course work in a minor department, and an additional 6 units of advanced work in the major or minor department, or in other pertinent departments. Furthermore, an acceptable thesis is necessary for the fulfillment of the degree requirements.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of zoology, courses in the minor subject, wide reading in science in general and in biology in particular, research,

and a dissertation based on original work. Minor work is available in many fields, including anatomy, biochemistry, botany, chemistry, geology, physics, physiology and psychology.

FOR SENIORS AND GRADUATES

201. ANIMAL BEHAVIOR.—A review of the major developments in the field with emphasis on recent physiological and developmental studies. Prerequisites: Physiology, Genetics and Evolution, or consent of instructor. 3 units; 4 units with laboratory. (1965-66) ASSOCIATE PROFESSOR KLOPFER

203. ECOLOGY.—Relation of animals to environment. Lectures, reading, reports, conferences; laboratory and field work. 4 units. (See also Marine Laboratory.) PROFESSOR GRAY

210. EXPERIMENTAL GENETICS.—The relation of phenotype to genome and environment; cytogenetics, recent research in the field of genetics. Laboratory. Prerequisites; Principles of heredity (one of the following: Zoology 110, Botany 101, 202, or equivalent) or consent of instructor. 4 units. (Not 1965-66) ASSOCIATE PROFESSOR WARD

214. BIOLOGICAL OCEANOGRAPHY.—Composition in time and space of marine biosphere in relation to descriptive marine chemistry, physics, and geology. Some work at sea aboard the Research Vessel. Prerequisites: A course in Invertebrate Zoology, Ecology, Marine Biology or an appropriate equivalent. Chemistry through organic. One year of Physics and Mathematics. 4 units. (*Given at Beaufort.*) PROFESSOR MENZIES

216. LIMNOLOGY.—A study of lakes, ponds, and streams, including their origin, development, geochemistry, energy balance, productivity, and the dynamics of plant and animal communities living in them. Lectures, field trips, laboratory work. Prerequisites: one year each of biology, chemistry, and physics and Mathematics 21; or permission of instructor. 4 units. (Not 1965-66) ASSOCIATE PROFESSOR LIVINGSTONE

22. ENTOMOLOGY.—Anatomy, physiology, embryology, and classification of insects. Prerequisite: one year of zoology. 4 units.* PROFESSOR GRAY

224. VERTEBRATE ZOOLOGY.—A study of life histories, adaptations, ecology, and classification of vertebrate animals. Prerequisite: Zoology 53. 4 units. (1965-66) ASSOCIATE PROFESSOR BAILEY

228. EXPERIMENTAL EMBRYOLOGY.—Lectures, readings, reports, and laboratory work. 4 units. (1965-66) PROFESSOR GREGG

238. SYSTEMATIC ZOOLOGY.—The fundamental theory and practice involved in the collection, identification, and classification of animals. Prerequisite: Zoology 1, 2. 4 units (Not 1965-66) ASSOCIATE PROFESSOR BAILEY

243. CYTOLOGY.—The structure of the cell. Lectures, readings, reports, and laboratory work. Prerequisites: Zoology 53, 92, 156, or equivalent and consent of instructor. (This is the same course as Botany 203.) 4 units. STAFF

245. RADIATION BIOLOGY.—Actions of ionizing and excitational radiations on life processes: a survey and an adventure in biophysics. Prerequisites: college physics and mathematics, organic chemistry. 3 units, or 4 units with laboratory. (1965-66) ASSOCIATE PROFESSOR FLUKE

246. MOLECULAR BIOLOGY.—The nature, functional relationships and replication of biological structure of the molecular level. Laboratory projects optional by arrangement. Prerequisites: College physics, mathematics, and organic chemistry. Biochemical and genetic background are suggested. 3 units, or 4 with instructor's advanced approval of laboratory work. (Not 1965-66) ASSOCIATE PROFESSOR FLUKE

247. BIOLOGICAL NUCLEONICS.—Laboratory instruction in biological uses of radioactive tracers, primarily with microörganisms, in counting instruments and measurements, and in legal requirements. Prerequisites: by consent of the instructor and normally two years of biology and one year of college chemistry. 2 units. (1965-66) ASSOCIATE PROFESSOR FLUKE

250. PHYSIOLOGICAL ECOLOGY OF MARINE ANIMALS.—A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla from various habitats are studied. Prerequisite: A course in physiology. 6 units. (*Given at Beaufort*)
ASSOCIATE PROFESSOR VERNBERG

252. COMPARATIVE PHYSIOLOGY.—The physiological mechanisms of animals studied on a comparative basis. Prerequisite: Zoology 151 or equivalent. 4 units.
PROFESSOR SCHMIDT-NIELSEN

253. ADVANCED VERTEBRATE MORPHOLOGY.—Descriptive and experimental studies in comparative vertebrate morphogenesis. Lectures, readings, reports, and laboratory. Prerequisites: Zoology 53, 92. 4 units.* PROFESSOR HORN

271. CELLULAR PHYSIOLOGY.—The physiological processes of living matter approached through studies of cells. Prerequisites: two years of biology and at least one year of chemistry. 4 units. PROFESSOR WILBUR

274. INVERTEBRATE ZOOLOGY.—A study of structure, functions, and habits of invertebrate animals under normal and experimental conditions. Field trips will be made to study, collect, and classify animals in their natural habitats. Prerequisites: Zoology 1 and 2. 4 units.* (See also Marine Laboratory)
PROFESSOR BOOKHOUT

276. PROTOZOOLOGY.—The morphology, physiology, taxonomy, and culture of protozoa. Prerequisites: Zoology 1 and 2. 4 units.* PROFESSOR BOOKHOUT

278. INVERTEBRATE EMBRYOLOGY.—Lectures, readings, and laboratory work dealing with rearing, development, and life history of invertebrates. Prerequisite: Zoology 92. 4 units.* PROFESSOR BOOKHOUT

FOR GRADUATES

351, 352. DEPARTMENTAL SEMINAR.—A weekly meeting of graduate students and faculty to hear reports and to discuss biological facts, theories, and problems. One hour a week throughout the year. 1 unit credit by arrangement.
ALL MEMBERS OF THE GRADUATE STAFF

353, 354. RESEARCH.—Students who have had proper training may carry on research under direction of members of the staff in the following fields: (A) Embryology, (B) Physiology, (C) Cytology, Histology, (D) Invertebrate Zoology, (E) Ecology, (F) Morphology, (G) Parasitology, (H) Vertebrate Zoology, (I) Limnology, (J) Entomology, (K) Genetics, (L) Biophysics, (M) Animal Behavior, (N) Systematics, (O) Oceanography. Hours and credits to be arranged.
ALL MEMBERS OF THE GRADUATE STAFF

355, 356. SEMINAR.—One or more seminar courses in particular fields are given each semester by various members of the staff. These will be in the fields indicated under courses 353-354 above. 2 units.

MARINE LABORATORY.—The following courses will be given at Duke University Marine Laboratory, Beaufort, N. C., during the summer of 1965: 203, Marine Ecology; 250, Physiological Ecology of Marine Animals; 274, Marine Invertebrate Zoology. Students with the proper training may register for 353 and 354, Research in Zoology.

MASTER'S DEGREE FOR STUDENTS SPECIALIZING IN PHYSICAL THERAPY

Students specializing in physical therapy may request admission to the Graduate School and if admitted follow the curriculum for the Master of Arts degree of either the Anatomy or Physiology Department. Selected physical therapy subjects are integrated with the graduate courses the first year. A thesis and the remaining physical therapy courses and practicum may be completed the second year. Upon satisfactory completion of the requirements a Master of Arts degree and a Certificate in Physical Therapy will be awarded. For information concerning the Physical Therapy Program write Miss Helen Kaiser, Director, Physical Therapy Department, Box 3247, Duke University Medical Center.

THE SCHOOL OF LAW

Fall semester begins September 16, 1965

Spring semester begins January 31, 1966

The School: Its Purpose and Methods

THE OFFICIAL NAME of the School is the Duke University School of Law, but it will be referred to in these pages as the Duke Law School or the Law School.

The Duke Law School stems historically from the School of Law of Trinity College, with its history of legal instruction running back to the middle of the past century, antedating the Civil War. When, in the 1920's, Trinity College became Duke University, the Law School was completely reorganized. This reorganization culminated with the housing of the Law School on the new West Campus in 1930, when the character of the Duke Law School can be said to have been reshaped.

The curriculum of the Law School provides thorough preparation for the practice of law in any state, and its graduates have been admitted to the bar throughout the nation. Opportunities for specialization in particular branches of the law are afforded.

In carrying out the trust imposed by the indenture establishing the Duke Endowment, the Law School seeks to have the student acquire knowledge and comprehension not only of legal doctrine, but also of the judicial process and of the social, economic, and political problems with which law and lawyers must deal. The method of instruction employed compels analysis of judicial opinions and inquiry into the nonlegal as well as the legal considerations which underlie them. In appropriate courses, special consideration is given to the work of the legislative and administrative agencies of government. In recognition of the increasing importance of the role of the lawyer in representing private interests before government agencies and in government service, a broad program is offered in the public law field. Scope for creative student work is provided by seminar courses and supervised individual study and research.

Practical training is not left for the first years of practice. A carefully integrated series of courses is designed to give students actual experience in the work of lawyers. Legal research, writing courses, moot court work and practical study of steps in law suits in the first and second years are followed in the third year by seminar courses emphasizing trial techniques, legal planning and drafting and interdisciplinary approaches. A student bar association affords a means whereby the student may gain acquaintance with the professional organizations through which a lawyer may and should contribute to the well-being of his profession and society.

Admission, Registration, and Fees

Admission

DIRECTIONS TO APPLICANTS FOR ADMISSION

APPLICATION must be made on the prescribed Law School application blank which will be sent upon request. A fee of $10.00 is charged for filing an application. No applicant will be accepted until all required documents are on file. These documents are: (1) the application itself, to which a recently made personal photograph must be attached; (2) a transcript of college record (see next paragraph); (3) a report of the applicant's score on the Law School Admission Test, described below; (4) letters from an official of the college attended and from three or more responsible persons who are acquainted with the applicant's character and general qualifications. *These letters will be requested by the Law School,* and the applicant need only furnish the names and addresses of persons from whom the desired information can be obtained.

Most of our applicants apply at a time when they are still in college, either in the fall or winter of their current college year. We do not ordinarily wait for the completion of the current year's college work before admitting an applicant; normally we take acceptance action on the basis of a transcript showing college work through the junior year, although we may at times ask for a transcript showing also one semester or term of the senior year. Such acceptance is tentative only and is subject to our final action taken in the light of the further supplemental transcript showing all the college work required for admission to the Law School. (However, it is very rare for an accepted applicant to be later rejected on the basis of his completed transcript.) A good time for a student in college to apply, particularly if he has an outstanding record and wants to make his law school plans early, is in the fall of his final year.

Admitted applicants are required to deposit the sum of $50.00 with the Office of the Bursar. This deposit is non-refundable, but will be credited to the account of the matriculated student.

The Law School Admission Test, referred to above, is administered by the Educational Testing Service. It is given four times a year at examination centers conveniently located throughout the United States. No special preparation for the test is suggested, since it is designed to measure aptitudes, abilities, and general background rather than knowledge of subject matter. The applicant's score on the test

will be considered along with other data in passing upon his admission to the Law School. Application forms and information concerning the test should be procured by writing directly to the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

TIMES OF ADMISSION

Beginning students may enter only at the opening of the fall semester in any year. Students who have completed the first year of law study at this or any other law school approved by the Association of American Law Schools may enter at the beginning of any semester.

REQUIREMENTS FOR ADMISSION

An application for admission to Duke Law School as a candidate for the degree of Bachelor of Laws may be submitted by any person who is a graduate of a college of approved standing. Applications may also be submitted by a candidate who has completed in a college of approved standing work equivalent in number of units to three-fourths of that required for graduation and whose college work is of outstanding superior quality and in its entirety shows an average grade far above that required for graduation, the requirement in each case being determined by the regulations of the college where the work was taken.

COMBINED COURSE

A number of colleges, upon application by their students, have permitted those who have completed three years of undergraduate work to enter the Duke Law School and upon the satisfactory completion of the first year of law school work to receive their Bachelor of Arts degree from such colleges. It is suggested that students desiring to enter Duke Law School under such a program make inquiry of their proper college authorities regarding this point if they meet the applicable requirements of the preceding paragraph.

A student from an undergraduate college of Duke University who has completed therein three years of study may apply to that college to enroll in a combined course wherein his first year of law study may be accepted toward the Bachelor of Arts degree. Upon the completion of four additional semesters of law study, he will receive the Bachelor of Laws degree.

Students considering entrance before obtaining the Bachelor's degree should consult the rules of the Board of Bar Examiners in the state where they plan to practice law, for regulations applicable to this program.

ADMISSION TO ADVANCED STANDING

Any person who has complied with the requirements for admission set forth in this announcement prior to the commencement of his law

study, who presents evidence of the satisfactory completion of at least one year of study at any law school which is a member of the Association of American Law Schools, and who is eligible for readmission to the law school from which he proposes to transfer, may be admitted to advanced standing, subject to such rules as would be applicable to students in this School having a comparable scholastic record. Provisional credit for courses so completed will be given, final credit being conditioned on the completion of at least one full year of law study in this School with an average at least five points above the passing grade. Adjustment of credit for work done in such other law schools may be made by the Dean or by vote of the Faculty.

CANDIDATES FOR GRADUATE DEGREES

Applications for admission to graduate study should be addressed to the Dean of the Law School and should include transcripts of records of legal and prelegal work. For the requirements for the graduate degrees, see pages 20-23.

Registration

All students are required to register on the dates prescribed in the Law School Calendar, at which time class schedules and course cards must be filled out and approved. A student's registration for any semester is not complete until he has settled all indebtedness with the Office of the Bursar. Students who register in any semester at a date later than that prescribed are required to pay to the Office of the Bursar a $5.00 penalty for late registration.

REGISTRATION FOR BAR EXAMINATION

Many states now require that a student, prior to or shortly after beginning of the study of law, register with the board of bar examiners of the state if he intends to practice therein. Each student should ascertain by writing to the secretary of the board of bar examiners of the state in which he plans to practice, or by other channels of information, whether that state makes this requirement.

CONDUCT OF STUDENTS

All students are admitted subject to the rules of the University and of the Law School, and continuance in the School is conditioned upon the observance of such rules.

The University expects of its students loyal and hearty co-operation in developing and maintaining high standards of conduct and scholarship. The University, therefore, reserves the right, and matriculation is a concession by the student of this right, to compel the withdrawal of any student whose conduct at any time is not satisfactory to the University.

Fees and Expenses

Tuition is due and payable not later than the day of registration for a particular semester. For the academic year 1965-1966, the tuition is $600.00 a semester. After the final day of registration no refund of the tuition will be made except for involuntary withdrawal to enter the armed forces.

Law students may secure admission to all regularly scheduled University athletic contests held on the University grounds during the entire academic year by payment of the athletic fee of $15.00 per year plus any taxes that may be imposed. (This fee is payable in the fall semester.) They also may use the facilities of the Duke Golf Course upon payment of student green fees.

It is estimated that the expenses of a thrifty unmarried student at Duke Law School, aside from tuition, can be kept around $1,250.00 per academic year.

Additional fees and expenses are discussed under the headings Living Accommodations, Dining Service, and Motor Vehicles.

Scholarships, Loans, and Employment

Scholarships are available, varying in amount. Except for a few scholarships that are based purely on merit, scholarships are awarded only to needy applicants with markedly superior college records and comparable Law School Admission Test scores. A scholarship may cover all or part of the tuition charge. The more usual form of financial aid is a combination of scholarship and loan. Scholarship grants will be continued to second- and third-year students maintaining a high standard of work.

To the extent of the funds allocated to Duke University from its participation in the student loan program established under the national Defense Education Act of 1958, loans up to $2,000 per year (so limited as of the present writing) are available to Duke students. Interest on these loans begins to accrue at three per cent one year after the student leaves the School, and repayment normally begins two years after the student leaves the School, with complete repayment scheduled over a ten-year period.

Loans from funds held in trust by the University are also available to qualified law students. Interest on these loans, which mature after the student has left the School, accrues from the date of each note at the rate of one per cent until the student has left the School and for five years thereafter at three per cent per year, with repayment in installments over the five-year period. Loans from these funds are available up to $1,200 per year, less the amount of any loan made under the paragraph above.

Approval of loan application is based on the financial need, scholastic attainment, and personal integrity of the applicant. Unmarried students with automobiles, who plan to live on campus, must establish a bona fide need for the automobile before a loan application will be approved.

In addition to the loans above mentioned, the School participates in the American Bar Association Loan Fund and United Student Aid Fund programs. These programs provide guaranteed commercial bank loans (on usual bank terms) to needy law students, up to $1,000 per year. These loans are readily available.

A special fund is also available for law students for small loans to tide over temporary financial emergencies arising during the course of the year.

Although it is not advisable for a law student to undertake any substantial amount of outside work, arrangements have been made to provide part-time employment for capable law students who otherwise would be unable to meet the expense of studying law at Duke.

A number of positions as assistants in the Law Library and as research assistants are open to students, particularly in their second or third year, with some preference being given to those who do not receive other aids from the University.

Living Accommodations

The Men's Graduate Center is available to men enrolled in the Law School. The rooms are equipped for two persons and the rental charge for a double room is $500.00 for the academic year or $250.00 for each occupant ($125.00 per semester for each occupant).

Epworth Inn on the Woman's College Campus is available to women enrolled in the Law School. The rental charge for a single room is $325.00 for the academic year or $162.50 for each semester. The rental charge for a double room is $550.00 for the academic year or $275.00 for each occupant ($137.50 per semester for each occupant).

Duke University Apartments, which consists of efficiency, one-, and two-bedroom apartments, are available to married graduate students. The apartments are complete with basic furnishings and the current rental charges per month are $70.00 for the efficiency, $80.00 for the one-bedroom, and $90.00 for the two-bedroom. Heat, electricity except for window fans and air conditioners, hot and cold water, garbage and trash collection, and maintenance of grounds are all included in the rental charge. For further information on married student apartments, write to the Director of Housing, Duke Station, Durham, North Carolina.

Residence hall rooms and Duke University Apartments may be reserved by new applicants after they have been accepted officially

for admission to the School of Law. Applications for residence hall rooms are to be made to the Director of Housing, Duke Station, Durham, North Carolina. A $25.00 deposit is required of each applicant before a residence hall room reservation is made. The initial room deposit is effective during the student's residence in the University residence halls if attendance is continuous in regular academic years. The deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated provided written notice is received at the Housing Bureau requesting refund.

b. Upon withdrawal from Duke University Residence Halls by students enrolled on the semester basis, provided written notice is received by the Director of Housing by August 1st for cancellation of a reservation for the fall semester, and not later than January 15th for cancellation of a reservation for the spring semester.

c. When the reasons requiring withdrawal are beyond the student's control.

No refund will be made until the occupant has checked out of his room through the Housing Bureau and has settled his account with the Bursar.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of the reservation.

The authorities of the University do not assume responsibility for persons selected as roommates. Each student is urged to select his roommate when the room is reserved. Any student who occupies a double room without a roommate will be given written notice from the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room.

Any exchange of rooms must be made at the Housing Bureau. Persons exchanging rooms without the approval of the Housing Bureau will be subject to the charges for both rooms.

Rooms are rented for the academic year but for no period of less than one semester without special arrangements. After the day of registration, no refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule. Regulations governing the occupancy of rooms will be supplied by the Director of Housing to those students who make application for housing.

DINING SERVICE

Food service is cafeteria style. The cost of meals runs approximately $1.75 to $2.50 per day, depending on the need and taste of the individual. The dining facilities on the West Campus include

three cafeterias with multiple-choice menus, a grill, and the Oak Room where full meals and *a la carte* items are served.

In the Men's Graduate Center there is a cafeteria with multiple-choice menus and a Coffee Lounge where sodas and sandwiches are served from 11:30 A.M. to 11:00 P.M. The prices in these dining rooms are the same as on the West Campus.

MOTOR VEHICLES

Each motor vehicle operated on the campuses by students enrolled in the School of Law must be registered at the Traffic Office within 5 days after arrival, and thereafter must display the proper registration emblem. To register a vehicle, the student must pay the prescribed fee of $30 and present the following documents:

1. State vehicle registration.
2. State operator's license.
3. Evidence of automobile liability insurance as required by North Carolina law: $5,000 per person and $10,000 per accident for personal injuries, and $5,000 property damage.

Parking, Traffic, and Safety Regulations will be given each student registering his vehicle. Students are expected to abide by these regulations.

MEDICAL CARE

With exceptions noted below, full medical and surgical care is furnished to all regularly matriculated law students of the University who have paid the semester tuition. This service is under the direction of the Physician in charge with the co-operation of the Staff of Duke Hospital. It includes hospitalization (limited to thirty days), medical and surgical care, drugs, dressings, x-ray studies, and ward (but not special) nursing. A charge for board is made at the same rate as in the University dining halls. Refraction of eyes and treatment of teeth and of all chronic and pre-existing conditions, such as diseased tonsils, hernia, elective surgery, chronic skin conditions, endocrine disturbances, etc., or accidents or illnesses occurring during vacations or while off the campus are not included in this service. The cost of any necessary braces and orthopaedic appliances, as well as special nursing, must be borne by the patient. If the student has insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of his medical care.

Further information will be sent upon request. Address

THE DEAN OF THE SCHOOL OF LAW

Durham, North Carolina

DUKE UNIVERSITY

Bachelor of Laws Degree

UPON favorable recommendation of the Faculty, the degree of Bachelor of Laws will be conferred on students who shall have successfully completed six semesters' study of law, the last two semesters of work immediately preceding the granting of such degree having been completed in this School.

A student shall be deemed to have completed successfully six semesters' study of law if during this period he has

(1) secured a passing grade in courses aggregating 84 semester hours;

(2) secured in every required course a grade not requiring repetition thereof; and

(3) secured a weighted average at least five points above passing, whether computed by including or by excluding the grades in the first-year courses.

Students who have spent only their last two semesters of study in residence in this School must have received a weighted average at least five points above passing for that year.

MINIMUM AND MAXIMUM STUDENT LOADS

No regular student is permitted to take less than twelve course hours per semester.

No first-year student is permitted to take courses in excess of the first-year program. Second- and third-year students are not permitted to take for credit more than sixteen course hours per semester, nor to audit and take for credit more than seventeen course hours per semester.

In exceptional cases, students may petition the Faculty for permission to take more or less than the prescribed maximum or minimum loads, but no student shall receive full residence credit if he takes fewer than ten hours per semester for credit.

ATTENDANCE

Regular class attendance is required. The right to take the examinations, as well as the privilege of continuing one's membership in the School at any time, is conditioned upon regular attendance at the exercises of the School.

STANDARDS OF SCHOLARSHIP

Eligibility to Continue Law Study.—Any student who at the end of his first year or at the end of any subsequent semester has an average grade lower than D on all the work then taken is ineligible to continue his work in the School. Any other student (1) whose average final grade at the end of his first semester is below D, or (2) whose average grade at the end of any subsequent semester on all the work then taken is below C, (3) who in any single semester or in any single year receives failure grades in courses totaling eight or more semester hours, may at any time be declared by the Dean ineligible to continue.

Notification of Unsatisfactory Scholastic Standing.—Every student subject to the provisions of the second sentence of the paragraph above, who has not been declared ineligible to continue his work in the School will be given a formal, written notice by the Dean's Office. This notice will set forth his average grade or grades and inform him (1) that he will be subject for the ensuing year to the special supervision of the Dean, who may order his dismissal from the School in the event of his failure to maintain a satisfactory scholastic standard, and (2) that he will be ineligible to receive a degree unless his work meets the scholastic requirements for graduation, which will be set forth in full in such notice.

Every other student whose average final grade at the end of any semester on the work of that semester, or on all work then taken, does not exceed the minimum average grade required for graduation by more than two points will be given a notice similar to that provided for above.

Graduate Work in Law

Objective of the Graduate Study Program

THE graduate program is framed with a view to the encouragement and recognition of legal scholarship. It is designed for the qualified candidate who aspires to a teaching career, or who wishes to become proficient in a special field of the law, to do legal research, to prepare himself for a public-law practice in or out of government, or to pursue studies in subjects he has not previously explored. This program is especially suitable for law teachers and for those who wish to become either law teachers or specialists in the law and who wish to carry on advanced study and original research under faculty supervision, and for foreign law students, teachers and lawyers who desire to extend their knowledge of the laws of the United States and to engage in comparative legal research.

Three graduate degrees are granted: the degree of Master of Laws (LL.M), the degree of Master of Comparative Law (M.C.L.), and the degree of Doctor of Juridical Science (S.J.D.).

Master of Laws

ADMISSION TO CANDIDACY FOR THE DEGREE OF MASTER OF LAWS

Any person who has received the first degree in law from a law school which is a member of the Association of American Law Schools, or from a university in the United Kingdom of Great Britain and Northern Ireland, or in Australia, Canada, Eire or New Zealand, may be admitted as a candidate for the degree of Master of Laws, provided he satisfies the Committee on Graduate Study that his objective in desiring to do graduate work in law is consistent with the purposes for which the program is offered, and provided he demonstrates to the Committee, on the basis of his record, his capacity to take and profit by graduate work in law. Normally the applicant will be required to show a level of scholarship appreciably higher than that required for the first degree in law at the institution from which he received that degree. Those applicants who aspire to a teaching career are expected to have had, and are expected to maintain throughout their graduate studies, an exceptionally high academic record.

REQUIREMENTS FOR THE DEGREE OF MASTER OF LAWS

The degree of Master of Laws is reserved for students who, having demonstrated their capacity for graduate work in law, maintain a level of scholarship substantially higher than that required for the degree of Bachelor of Laws.

The candidate for this degree is required to complete a course of study comprising not less than twenty nor more than twenty-six semester hours, or approved research equivalent thereto. Two full semesters are required for the completion of this program. A candidate for this degree is required to include in his course of study at least two courses or seminars selected from those offered in Jurisprudence, in Legal History, and in the International or Comparative Law area. Other suitable courses will be selected by the candidate subject to the approval of the Committee on Graduate Study. In special circumstances, credit of not more than two hours a semester may be given for approved special supervised-research projects. In addition to completing twenty semester hours of courses or seminars the candidate must prepare and submit an essay, representing substantial research on a legal subject. This essay is to be prepared under the supervision of the instructor in charge of the field in which the research is done. The candidate will find it helpful to have formulated a project of research, or alternative projects, before his admission to graduate study or, at any rate, before pursuing his graduate study in residence. In appropriate cases, the candidate will be permitted, and may be encouraged, to take related work in other departments of the University.

Master of Comparative Law

ADMISSION TO CANDIDACY FOR THE DEGREE OF MASTER OF COMPARATIVE LAW

Any person (1) who has received the degree of *doctor iuris* or its equivalent from a foreign university, or (2) who, having completed such academic training as is required in his country for the practice of law, has already demonstrated his special qualifications by publications in learned journals or otherwise, and who has the knowledge of and facility in the English language needed to achieve distinction in competitive study at an American university may be admitted as a candidate for the degree of Master of Comparative Law (M.C.L.). The applicant must satisfy the Committee on Graduate Study that his objective in doing graduate work in comparative law is consistent with the purposes for which the program is offered, and he must further demonstrate to the Committee, on the basis of a scholastic record comparable to at least a B average at an American law school of high standing, and by his previous publications, if any, his capacity to profit by graduate work in law. Normally, admission to candidacy for this

degree is limited to applicants who intend to study one or more specific fields of American law with a view to utilizing such knowledge upon their return to their respective countries, and who have already done some preparatory work in this direction.

Any person eligible to be admitted as a candidate for the degree of Master of Laws may, upon recommendation of the Committee on Graduate Study, be admitted to candidacy for the degree of Master of Comparative Law.

REQUIREMENTS FOR THE DEGREE OF MASTER OF COMPARATIVE LAW

The degree of Master of Comparative Law is awarded only to students who maintain a level of scholarship substantially higher than that required for the degree of Bachelor of Laws.

The candidate for this degree is required to complete a course of study comprising not less than twenty semester-hours. At least two semesters' residence are required for the completion of this program. A candidate for this degree is required to include in his course of study at least two courses from those offered in the World Law and Comparative Law area, and either Jurisprudence or Legal History. Other suitable courses will be selected by the candidate subject to the approval of the Committee on Graduate Study. In special circumstances, credit for not more than two hours a semester may be given for approved, supervised-research projects. The candidate is also required to submit an essay representing substantial research on a subject of comparative or international law, written in the English language. This essay is to be prepared under the supervision of the instructor in charge of the field in which the research is done. In appropriate cases, the candidate may be permitted and may be encouraged, to take related work in other departments of the University.

Doctor of Juridical Science

ADMISSION TO CANDIDACY FOR THE DEGREE OF DOCTOR OF JURIDICAL SCIENCE

A person holding the degree of Master of Laws or Master of Comparative Law (or Jurisprudence) from this or any other law school which is a member of the Association of American Law Schools may, on recommendation of the Committee on Graduate Study and favorable vote of the Faculty, be admitted to candidacy for the degree of Doctor of Juridical Science (S.J.D.), provided he completed the work for the Master's degree with distinction.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF JURIDICAL SCIENCE

Upon recommendation of the Faculty, the degree of Doctor of Juridical Science will be conferred on students admitted to candidacy for that degree who complete and submit a monograph or series of essays suitable for publication and deemed by the Faculty to be of distinguished character and who pass an oral examination before a special committee appointed for that examination. At least one academic year and, in the absence of an extension granted by the Faculty, not more than three years must elapse between the award of the Master's degree and the award of Doctor of Juridical Science. Students who have received the Master's degree from another law school must spend at least two full semesters engaged in research at this School, and in addition may be required to complete a course of study prescribed by the Committee on Graduate Study. The monograph or series of essays required may be based upon, or be an extension of, the essay required for the Master's degree, provided substantial additional research is represented.

Facilities and Activities

The Law School Building and Its Facilities

THE NEW Law School Building was completed and occupied in September, 1962. Located just off the Gothic core of the West (main) Campus, the building is of modified Georgian architecture with contemporary overtones. It reflects a notable characteristic of the School: a high ratio of facilities to students admitted. Despite long-range plans to keep the student body modest in size, the new Law Building in its general spaciousness, number of classrooms and seminar rooms, library reading-room seatings, library stack spaces, student carrels, student lockers, student lounge rooms, faculty offices, quarters for legal publications, special quarters for institutional studies and courtroom is of proportions ordinarily associated with a far larger student body.

Additional information concerning the Law School and its facilities is contained in the illustrated brochure *Studying Law at Duke.*

THE LAW LIBRARY

The Law Library is one of the large law school collections in the country. It consists of American and English statutory and case law; collections of international, comparative and foreign law materials; treatises, digests, encyclopedias; the various selected case series; a comprehensive collection of legal periodicals; and publications in the fields of history, economics, government, and other social sciences, supplemental to the strictly legal materials. The Library receives every current legal periodical of general interest printed in the English language and complete up-to-date legislation of the United States and of every state and territory of the Nation.

There are many thousands of additional volumes of a legal nature in the main University Library Building, as well as the general collection of over a million volumes, to all of which the law students and Faculty have convenient access.

The Law Library is administered by a professionally trained staff and is open to the public daily, as well as in the evenings when the Law School is in session.

RULE OF LAW RESEARCH CENTER

In the fall of 1958, the Duke Law School established its Rule of Law Research Center, with Professor Arthur Larson as its Director.

The purpose of the Center is to undertake both long-range and current studies and publications bearing on the settlement of international disputes and the achievement of peaceful change under law. Typical projects include "Sovereignty within the Law"; "Propaganda within the Law"; a definitive analysis of the World Court; and a series of studies of United Nations peace-keeping devices. A staff of about ten international lawyers is maintained, together with an undergraduate law student research assistant staff which generally numbers about twelve. The regular staff includes specialists in all the world's major legal systems. Opportunities for course work at the Law School include not only the regular courses in International Law, Comparative Law, and the Law of International Economic Relations, but a unique Seminar in World Law for students particularly interested in this approach to the problem of world order.

Duke University students are also encouraged to combine graduate work with activities of the Center, opportunities for which are made available as far as practicable.

Publications

LAW AND CONTEMPORARY PROBLEMS

The School of Law publishes a quarterly, *Law and Contemporary Problems,* edited by Professor Hans W. Baade. This periodical, now in its thirtieth volume, presents in each issue a symposium on a problem of current importance, in which the inter-related social and economic, as well as legal, factors are discussed by writers of competence in these respective fields.

The circulation of *Law and Contemporary Problems* extends not only to members of the legal profession and law libraries throughout the country, but also to industrial and financial concerns, governmental agencies, and public and general university libraries. Individual issues are not infrequently used as materials for study in University courses.

JOURNAL OF LEGAL EDUCATION

The *Journal of Legal Education,* a quarterly, is also edited at the School of Law, under the direction of Professor John D. Johnson, Jr. The publication serves as the organ for the Association of American Law Schools, providing a clearing house for ideas and professional studies in the constantly expanding field of legal education. The editorial policy of the *Journal of Legal Education* is determined by an editorial board named by the Association, assisted by an advisory committee consisting of prominent legal educators.

DUKE LAW JOURNAL

American legal education boasts at least one unique institution. Only in America, and only in law, are the scholarly professional journals edited and largely written by students. The *Duke Law Journal* carries forward this proud tradition, which dates from the latter part of the nineteenth century. Articles written by teachers, lawyers, judges and other scholars are critically evaluated and edited by the board of student editors. Notes and comments concerning recent judicial, legislative and other developments are written by the students themselves, and edited by their fellow students. Members of the Faculty are of course available for advice and consultation. The quarterly issues are widely circulated, and become an integral part of the store house of informal and critical materials to which the profession in all its branches must resort. The student-edited law journal has had a profound influence on the growth and development of the law.

Membership in the *Journal* is the highest honor that can be attained by the student, being reserved for those who not only excel in their courses but also demonstrate capacity to do creative research and writing. Moreover, in the well-nigh universal judgment of the profession, the experience gained in this work provides the best training that the Law School has to offer. It should be the aim of every qualified student to take advantage of this opportunity.

CORPORATE PRACTICE COMMENTATOR

The *Corporate Practice Commentator,* a quarterly periodical devoted to significant developments and new thinking in the field of corporation law and practice, is edited by Professor F. Hodge O'Neal. Although the *Commentator* is published by a commercial concern, it is assembled and manuscript is prepared in the School of Law under the direction of Professor O'Neal. The *Commentator* gives attention to matters of interest and importance to counselors and managers of corporate and other business enterprises. Primary emphasis is placed on corporation law and practice in the narrow sense, but a considerable amount of space is devoted to antitrust questions, labor matters, patents and copyrights, executives' compensation, fair trade legislation, and other matters arising out of business activities.

Organizations, Honors and Activities

THE DUKE BAR ASSOCIATION

The Duke Bar Association is the student governing organization of the Law School, and is organized along the lines of the American Bar Association. Its purpose is to introduce the student to the problems

considered by the Bar in professional organizations and to develop professional consciousness and responsibility.

The Duke Bar Association sponsors professional and social activities throughout the year. Dues are $15.00 per annum, payable in September.

ORDER OF THE COIF

A chapter of the Order of the Coif, national legal scholarship society, has been established at Duke University School of Law. Its purpose is "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." Election is restricted to the ten per cent of the graduating class who have attained the highest rank in their law school work.

MOOT COURT BOARD

A program of student Moot Court arguments is conducted under the supervision of the Moot Court Board as a part of the course in Research and Writing in which all first-year students are required to participate. In addition, a team of students is selected each year to represent the Law School in the National Moot Court competition.

INTERNATIONAL LAW SOCIETY

Recognizing the importance of the role of law in international affairs, the Duke International Law Society provides a program for examining the application of international law to world problems. Through a series of lecture-discussions in the fall called "A Short Course in International Law" and by featuring distinguished speakers in the field throughout the year, the Society provides its members the opportunity to make contact with the men and ideas that are shaping the development of international law.

Other activities include participation in the annual Philip C. Jessup International Law Moot Court competition, attendance at conferences sponsored by the Association of Student International Law Societies, and entry into various writing contests.

Membership is open to all law students at $5.00 per annum.

Recreational Facilities

The University is located about two miles from the business district of Durham on wooded hills constituting part of the five-thousand-acre Duke Forest, which is maintained by the School of Forestry. Within a short distance from the campus are facilities for golf, horseback riding and woodland hiking. Students of the Law School are entitled to the use of the University gymnasium, tennis courts, swimming pool, golf course, and similar privileges. Other opportunities

for physical activity are available through the Intramural Program as well as through such activity groups as the outing club, sailing club, cycling club and the like. Skiing has been increasingly enjoyed by various groups. Several bowling alleys are available in and near Durham. Motion pictures are shown in Page Auditorium twice a week, and concert programs, recitals, lectures, and plays are presented frequently.

Program of Instruction

First Year (Required)

	Semester Hours	
	Fall	Spring
Business Associations I		3
Chattel Transactions	2	
Civil Procedure	3	3
Contracts	3	3
Criminal Law & Procedure	2	2
Property I	2	2
Research & Writing	1	1
Torts	3	2
	16	16

Second and Third Year

In the absence of special authorization by the Dean, each student is required to take in each semester courses aggregating not less than 12 and not more than 16 hours.

The program in the second and third years is entirely elective. In planning his elective program, the student must bear in mind that certain courses are pre-requisites to other advanced courses:

Business Associations II is pre-requisite to the Seminars in Securities Regulation and Corporate Planning and Drafting.

Conflict of Laws is a pre-requisite to the Seminar in Conflict of Laws.

Evidence is pre-requisite to Trial Practice.

Federal Taxation I is a pre-requisite to Federal Taxation II and Federal Taxation III.

Federal Taxation I, Federal Taxation III, and Property II are pre-requisites to the Seminar in Tax and Estate Planning.

Labor Relations is pre-requisite to the Seminar in Labor Law.

Trade Regulation is pre-requisite to the Seminar in Public Regulation of Business.

Constitutional Law is pre-requisite to the Seminar in Civil Liberties and Rights.

The elective courses and seminars offered in the second and third years are:

	Semester Hours	
	Fall	Spring
Comparative Laws	3	
Conflict of Laws	3	
Constitutional Law	4	
Debtors' Estates	3	
Equitable Remedies	2	
Evidence	3	
Federal Taxation I	3	3
Federal Taxation II	3	
Insurance	2	
International Law	3	
Labor Relations	3	
Legal Accounting (not offered 1965-66)	2	
Legal History (not offered 1965-66)	2	
Legal Process	3	
Military Law	2	
Municipal Corporations	2	
Negotiable Instruments	2	
North Carolina Practice	2	
Property II	4	
Securities Regulation	3	
Seminar in Criminal Law	2	
Trade Regulation	3	
Workmen's Compensation	2	
Administrative Law		3
Admiralty		3
Business Associations II		4
Civil Liberties and Rights		2
Copyright and Unfair Competition		3
Corporate Planning and Drafting		2
Family Law		2
Federal Jurisdiction		2
Federal Taxation III		3
International Economic Relations		3
International Organizations		2
Jurisprudence (not offered 1965-66)		2
Legal Profession		1
Military Law		2
North Carolina Statutes		2
Real Estate Transactions		3
Regulated Industries (not offered 1965-66)		2
Sales		3
Security		3
Seminar in Conflict of Laws		2
Seminar in Criminal Procedure		2
Seminar in Labor Law		2
Seminar in Tax and Estate Planning (not offered 1965-66)		2
Seminar in Urban Renewal		1
Social Legislation		2
State and Local Taxation		2
Trial Practice		2
Trusts		3
World Law (not offered 1965-66)		3

Individual research by students for credit, not exceeding three semester hours per year, will be permitted, subject to the approval and under the supervision of a faculty member.

Description of Courses

Business Courses

BUSINESS ASSOCIATIONS I. Legal principles concerning association in business by agency, partnership, other unincorporated forms and corporations. Creation, form and nature of agency, partnership and corporation, corporate existence (de facto corporations, corporate entity and its limitations), powers, duties, liabilities and compensation of agents, partners, officers and directors, risks in conduct of business by representatives (vicarious liability in tort, authority to contract), imputation of notice and knowledge, scope of enterprise (ultra vires), revocation and termination of authority, ratification, undisclosed business associates, stability of the associational relationship. The purpose of this course is to grasp basic principles of Agency and Partnership and introductory related principles of corporation law. (The main basic study of corporation law, however, is in Business Associations II.) Three hours a week second semester. MR. LATTY

BUSINESS ASSOCIATIONS II. Promoters, subscription to and issue of shares, stock structure and corporate capital, dividends, preferred stock, bonds, capital increases and reduction, corporate re-acquisition of own stock, elementary principles of corporate accounting, public issue of securities, stock transfers, fundamental corporate changes (recapitalization, sale, merger and consolidation, dissolution), stockholders' suits, and certain principles concerning management and operation not studied in Business Associations I. Four hours a week second semester. MR. O'NEAL

CONTRACTS. The formation and legal operation of contracts in general, with attention to problems of drafting and counseling as well as of litigation and extrajudicial settlement. Legal and equitable remedies in contract cases, including damages, specific performance, and restitutionary remedies, and important procedural devices incident to such remedies. Three hours a week throughout the year. MR. VAN ALSTYNE

SEMINAR IN CORPORATE PLANNING AND DRAFTING. The student is given hypothetical corporate problems (perhaps taken from the practicing lawyer's desk) on a client's proposed course of action; each problem is designed to require the student to grasp the business situation and goals involved, analyze for pertinent legal principles, plan the transaction to avoid legal business (including taxation) pitfalls, plan the requisite steps to consummate the desired transaction, draft the appropriate papers and present his research. Two hours a week second semester. MR. O'NEAL

DEBTORS' ESTATES. Comparative study of methods used for the liquidation of debtors' estates. The nonbankruptcy materials cover individual creditor's rights by attachment, garnishment, execution, creditors' bills and the like; common law composition; and general assignments. The bankruptcy materials cover, in the main, the first seven chapters of the Bankruptcy Act. Three hours a week first semester. MR. SHIMM

INSURANCE. The nature of "insurance"; government supervision and control; types of insurance organization; the legal requirement of insurable interest; interests of others than the named insured; the measure of indemnity; subrogation; the beneficiary's interest in life insurance; the insured event and excepted causes; warranties, representations and concealment; the making of insurance contracts; waiver, estoppel and election. Two hours a week first semester. MR. JOHNSTON

INTERNATIONAL ECONOMIC RELATIONS. See Public Law Courses, page 35, for description.

LEGAL ACCOUNTING. An examination and analysis of accounting principles and practices necessary for reasonably effective collaboration with accountants on

problems requiring the work of both lawyers and accountants. The course is designed to develop in the student an understanding of how an accountant's work is used by top management in making decisions, by government in making and enforcing regulations, and by investors and lenders in exercising a discriminating choice in the employment of their funds. (Not offered in 1965-66.)

NEGOTIABLE INSTRUMENTS. Study of the rules of the law merchant and the provisions of the Negotiable Instruments Law and the Uniform Commercial Code relating to the functions and legal incidents of checks, bills of exchange, promissory notes, and similar commercial instruments. Two hours a week first semester. MR. SHIMM

SALES. Study of the rules of the common law and the provisions of the various uniform acts and the Uniform Commercial Code relating to warranties, risks, remedies for breach, financing, and other legal problems arising in the sale of goods. Three hours a week second semester. MR. SHIMM

SEMINAR IN PUBLIC REGULATION OF BUSINESS. See Public Law Courses, page 35, for description.

SECURITIES REGULATION. See Public Law Courses, page 34, for description.

TRADE REGULATION. See Public Law Courses, page 35, for description.

Property Courses

CHATTEL TRANSACTIONS. This course uses the field of Personal Property and the traditional title-passing rules of Sales to appraise judicial reasoning and legal concepts. It serves both as a low-level course in judicial methodology and an introduction to commercial law. It deals with possession and title of chattels, the bailment relationship, artisan's lien, transfer of chattels by gift and miscellaneous inter-vivos transactions. It does not go into details of enforcement of buyers' and sellers' rights or sales financing. Two hours a week first semester. MR. LATTY

PROPERTY I. The basic concepts of real property law and conveyancing. Historical background; estates in land, including the fee simple, the fee tail with its statutory substitutes, the life estate, the estate for years and other non-freeholds; concurrent ownership; types of future interests; conveyances before and after the Statutes of Uses; landlord and tenant; the modern deed—kinds, delivery, description, title covenants; covenants and agreements running with the land at law and in equity; easements; recording and title registration. Two hours a week throughout the year. MR. BOLICH

PROPERTY II. The various rules and concepts governing transmission of property from one generation to another, including the materials normally covered in the traditional courses on Wills and Future Interests. Historical background; intestate succession at common law and under modern statutes; limitations upon testamentary power; execution and revocation of wills; contest of wills; lapse, ademption and satisfaction; future interests, comprising reversions, remainders, executory interests, rights of entry, possibilities of reverter, and their incidents; class gifts; powers of appointment; rule against perpetuities and other restrictions on the creation of interests; construction of wills and deeds. Four hours a week first semester. MR. BOLICH

REAL ESTATE TRANSACTIONS. Aspects of real estate practice including land-use development through private devices involving restrictive covenants, easements, conditions and other concepts; public control by zoning and subdivision legislation; public-private developments such as urban renewal; and some special problems, including cooperative apartments and shopping centers. Three hours a week second semester. MR. BOLICH

SECURITY. Mortgage and security interests in real property, and suretyship. Three hours a week second semester. MR. SHIMM

SEMINAR IN TAX AND ESTATE PLANNING. Seminar devoted to problems and techniques of tax and estate planning. Enrollment limited. Two hours a week second semester. (Not offered in 1965-66.)

TRUSTS. The nature, creation and elements of a trust; character and transfer of the beneficiary's interest; charitable trusts; administration of trusts; termination and modification of trusts; liabilities to and of third persons; enforcement of trusts; and constructive and resulting trusts. Three hours a week second semester.
MR. JOHNSTON

Public Law Courses

ADMINISTRATIVE LAW. The formulation of statutory schemes of administrative regulations: the organization of administrative agencies; the determination, promulgation and enforcement of administrative programs; the respective spheres of administrative and judicial responsibility; judicial control over administrative action. Practice and procedure before administrative agencies: informal conferences and negotiations; formal hearings; constitutional limitations. Three hours a week first semester. MR. HAVIGHURST

SEMINAR IN CIVIL LIBERTIES AND CIVIL RIGHTS. Studies in the field of personal liberties (freedom of speech, press, religion, association, etc.) and in the field of civil rights (right to non-discriminatory treatment, right to fairness in procedure, etc.). The seminar will be concerned with issues about which the law is unsettled, and especially with issues raised in cases pending before the Supreme Court of the United States. Two hours a week first semester. MR. WALLACE

CONSTITUTIONAL LAW. The distribution of and limitations upon governmental authority under the Constitution of the United States. Included are study of the doctrine of judicial review of legislative and executive action; the powers of Congress and the President; the limitations on State governmental powers resulting from the existence or exercise of Congressional power; and judicial protection against the exercise of governmental power in violation of rights, liberties, privileges, or immunities conferred by the Constitution. Four hours a week first semester. MR. VAN ALSTYNE

COPYRIGHT AND UNFAIR COMPETITION. Legal problems arising in the production, marketing, and distribution of literary, artistic, musical, and related achievements. While the course will be concerned primarily with statutory and common law copyright, it will include study of the law of unfair competition, including legal protection of trade marks and trade names, and some comparison of copyright with the law of patents and design patents. Three hours a week second semester. MR. WALLACE

CRIMINAL LAW AND PROCEDURE. An introductory study of the law of crimes and the administration of criminal justice; analysis of the criminal act and the mental element in crime; consideration of specific offenses as defined by statute and the common law; discussion of typical defenses in relation to specific crimes; study of the elements of Anglo-American criminal procedure. Two hours a week throughout the year. MR. LIVENGOOD

SEMINAR IN CRIMINAL LAW. Current problems in administering criminal justice, including studies of theory and technique in criminal procedure (investigation, prosecution and defense of criminal charges), inquiry into basic policy in the use of criminal sanctions for the promotion of public order, consideration of contemporary developments (legislative, judicial and administrative) in substantive and adjective criminal law, and analysis of specific problem areas such as mental responsibility, sexual deviation, attempts, and vicarious liability. Two hours a week first semester. MR. LIVENGOOD

SEMINAR IN CRIMINAL PROCEDURE. Investigation of crime and the police practices pertinent thereto, including detention and arrest, interrogation, search and seizure; exclusionary rules of evidence; motions for continuence, change of venue, and challenges to the jury; problems of the indigent defendant; discovery problems in criminal trials; post-trial appellate procedures. Two hours a week second semester. MR. EVERETT

FEDERAL JURISDICTION. A study of the federal courts with respect to the part played by them in achieving a workable federalism. Special attention will be given to the original jurisdiction of the federal district courts, the relationship of

the federal courts to state courts and state law, and the permissible and desirable range of federal judicial power. Two hours a week second semester. MR. PASCHAL

FEDERAL TAXATION I. An introduction to federal taxation with emphasis on the federal income tax. The topics considered include such basic concepts of income taxation as taxable income, deductions, the taxable person, accounting for income and deductions, computation of the tax, and capital gains and losses. Three hours a week each semester. MR. LOWNDES

FEDERAL TAXATION II. A continuation of Federal Taxation I. Among the topics considered are the taxation of corporations and corporate distributions, corporate reorganizations and readjustments, the personal holding company surtax and the accumulated earnings tax, the taxation of partnerships, and of corporations electing to be taxed as partnerships. Three hours a week first semester. MR. LOWNDES

FEDERAL TAXATION III. The principal emphasis of the course is on the federal estate and gift taxes. Consideration is also given, however, to the related portions of the federal income tax dealing with the taxation of the income of estates and trusts and income in respect of a decedent. Three hours a week second semester. MR. LOWNDES

INTERNATIONAL ECONOMIC RELATIONS. Legal framework of U. S. foreign trade and investment; foreign trade and investment laws of selected foreign countries; function of international economic law; international economic agreements; problems of foreign trade and investments. Three hours a week second semester. MR. BAADE

INTERNATIONAL LAW. A survey of public international law of peace, as evidenced especially in decisions of national and of international courts; the drafting and interpretation of treaties; the nature of handling of international claims; the organization and jurisdiction of international tribunals, with special reference to the International Court of Justice; developments with respect to the codification of the law. Three hours a week first semester. MR. BAADE

LABOR RELATIONS. A study of the law relating to collective bargaining and concerted labor activities, including the National Labor Relations Act and related legislation, the legal aspects of strikes, boycotts and picketing, the negotiation and administration of collective bargaining agreements, procedures for the settlement of labor disputes, and relations between the union and individual employees. Three hours a week first semester. MR. LIVENGOOD

MUNICIPAL CORPORATIONS. State legislative creation and control of local governmental units, municipal police power, limitations on taxation, indebtedness, and expenditures of funds, bond issues, tort liability, annexation, eminent domain, subdivision regulation, public housing, and urban renewal. Considerable field work is planned. Two hours a week first semester. MR. EVERETT

SECURITIES REGULATION. A study of the federal and state securities laws and the industry they govern, with emphasis on the mechanics and regulation of the distribution process and trading in securities; subjects dealt with include the functions of the Securities and Exchange Commission, registration and disclosure requirements and related civil liabilities, "blue sky" laws, proxy solicitation and reporting requirements, broker-dealer regulation, the self-regulatory functions of the exchange, and the regulation of investment companies. Three hours a week first semester. MR. HAVIGHURST

SEMINAR IN LABOR LAW. An intensive examination of significant problems in collective bargaining, union-management relations and labor dispute settlement, with emphasis upon the drafting and interpretation of contract clauses, theories and techniques in contract negotiation, grievance handling, voluntary arbitration and other procedures for the adjustment of disputes, and the inter-relation of the legal and economic aspects of labor problems. Two hours a week second semester. MR. LIVENGOOD

SEMINAR IN LAW AND POLITICS. Directed research and study of selected materials on the constitutional and other legal problems involved in such topics as legislative apportionment; federal protection of voting rights; political activities of government employees and of organizations such as labor unions, corporations, and trade associations; defamation of or by governmental officials or candidates for

public office, etc. Legal questions relating to the acquisition or loss of United States citizenship and the consequences thereof are also within the possible range of subject matter. Two hours a week second semester. MR. WALLACE

SEMINAR IN LEGISLATION. Studies in the legislative process and in the drafting and interpretation of statutes. Included will be exercises in legislative drafting in addition to study of selected materials on such subjects as lobbying, legislative procedures, legislative investigations, legislative-administrative relations, and statutory interpretation. Two hours a week second semester. MR. WALLACE

SEMINAR IN MILITARY LAW. A study of military jurisdiction, the rights of military personnel, the body of both substantive and procedural law that has developed under the Uniform Code of Military Justice; in addition to its other goals, the seminar will seek to develop skills in statutory interpretation and to encourage comparisons between civilian and military criminal law administration. Two hours a week first semester. MR. EVERETT

SEMINAR IN REGULATED INDUSTRIES. Selected studies of government economic regulation in such regulated industries as transportation, broadcasting, and power, plus directed research and writing in specific problems of trade regulation. (Not offered in 1965-66.)

SEMINAR IN URBAN RENEWAL. A study of the urban renewal program, as implemented at the federal and local levels. Extensive field work is planned and urban renewal officials will meet with members of the seminar to discuss problems of implementing an urban renewal program. One hour a week second semester. MR. EVERETT

SOCIAL LEGISLATION. Contemporary public welfare law, with emphasis on government regulation of conditions of employment, including the Fair Labor Standards Act and other wage-hour and child-labor statutes, unemployment insurance and other social security legislation, employers' liability and workmen's compensation acts, and related laws establishing minimum standards for the creation, continuance and termination of the employment relationship. In addition to other objectives, the course will seek to develop skills in legislative advocacy and procedure, and in the drafting and interpretation of statutes. Two hours a week second semester. MR. LIVENGOOD

SEMINAR IN TAX AND ESTATE PLANNING. See Property Courses, page 32, for description.

STATE AND LOCAL TAXATION. Constitutional limitations on the taxing power; jurisdiction to tax; state excise taxes; and the general property tax. Two hours a week second semester. MR. VAN ALSTYNE

TRADE REGULATION. A study of the federal antitrust laws and their common law background, with emphasis on the economic policies involved, and of specific unfair trade practices and unlawful restraints at common law and under state and federal statutes. Attention is given to a critical examination of legislation designed to enforce competition as the primary control of the economic system; legal measures that supplement or replace competition; the relation of patents and antitrust; price discrimination; fair trade laws; regulation of advertising; trademarks and trade-names; appropriation of trade values; boycotts; and disparagement. Three hours a week first semester. MR. WALLACE

SEMINAR IN WORKMEN'S COMPENSATION. The main elements of Workmen's Compensation Law of the United States are covered through the assignment of typical office problems on which legal memoranda or opinions are prepared. Two hours a week second semester. MR. LARSON

SEMINAR IN WORLD LAW. This is a discussion seminar open to students of the Law School and the Political Science Department, and to a limited number of other students with satisfactory backgrounds. The emphasis of this course is around those aspects of National law and International law which have an important influence on weakening or strengthening a world legal order. Detailed attention is given to the United States judicial decisions, other laws, and relevant policies effecting the relation of the United States to such a world legal system. Special attention is also given to decision of the International Court of Justice and to Constitutional treaties. The course will not duplicate the material in the regular

course on International Law. Efforts are made through the seminar discussions to develop an adequate concept of world law. Three hours a week first semester. (Not offered in 1965-66.)

General Courses

ADMIRALTY. The special body of law governing maritime affairs, especially the transportation of goods and passengers by water. Admiralty jurisdiction; marine insurance; carriage of goods; charter parties; general average; rights of injured seamen and others; collision; salvage; maritime liens and ship mortgages; limitation of liability; governmental activity in shipping. Three hours a week second semester. MR. CURRIE

COMPARATIVE LAW. An examination and comparison of the law of selected jurisdictions on certain specific topics. The history, sources, and methods of the civil law will be investigated, discussed, and compared with those of common law countries. Three hours a week first semester. MR. BAADE

CONFLICT OF LAWS. A study of the special problems which arise when the significant facts of a case are connected with more than one jurisdiction. Recognition and effect of foreign judgments; choice of law; federal courts and conflict of laws; the United States Constitution and conflict of laws. Three hours a week first semester. MR. CURRIE

EQUITABLE REMEDIES. A survey of equitable remedies in general (including enforcement of equity decrees) and of important parts of the fields of equity and restitution that are not covered in other courses. Two hours a week first semester. MR. PASCHAL

FAMILY LAW. Marriage; annulment; divorce; separation; property rights. Two hours a week second semester. MR. BAADE

JURISPRUDENCE. Discussion of some of the basic problems of classical and contemporary juristic theory, with applications to cases and statutes. Open to all graduate students, and, with the consent of the instructor, to qualified second and third year students. Three hours a week second semester. (Not offered in 1964-65.)

LEGAL HISTORY. A study of the development of fundamental English and American legal institutions, with primary emphasis upon the establishment and growth of American law from the colonial period to the present. Two hours a week second semester. (Not offered in 1964-65.)

THE LEGAL PROCESS. A study of problems in the making and application of law and of the institutions for solving those problems. This has been called a course in "working jurisprudence." It deals with major jurisprudential concepts, not in the abstract but in an attempt to put them to work in the solution of specific legal problems. The problems cut across conventional course lines and include not only those confronted by courts, but also those confronted by private persons and their counsel, legislatures, administrative agencies, public officials, and others. Three hours a week first semester. MR. CURRIE

NORTH CAROLINA STATUTES AND DECISIONS. A study of selected statutes of North Carolina with discussion of their application, and an analysis of the decisions of the Supreme Court of North Carolina construing them. Two hours a week second semester. MR. BRYSON

PATENT LAW. A short survey of the law relating to patents and trademarks, with some coverage of copyrights, primarily to give the general practitioner a foundation in these areas to collaborate effectively with specialists. Special attention is given to overlapping problems in above-mentioned areas. One hour a week first semester. (Not offered in 1964-65.)

SEMINAR IN THE CONFLICT OF LAWS. Advanced study of selected problems in the conflict of laws. Research paper required. Two hours a week second semester. MESSRS. CURRIE AND BAADE

TORTS. The bases of liability in damages for personal injuries and injuries to property; bases other than fault; negligence; intentional infliction of harm. Procedure in jury trials; proof of negligence; causation and "proximate cause"; de-

fenses. Special rules applicable to occupiers and owners of land, motor vehicle accidents, suppliers of goods and remote contractors. Misrepresentation and fraud; defamation; assault and battery; false imprisonment. Three hours a week first semester, two hours a week second semester. MR. HARDIN

Procedure and Practice Courses

CIVIL PROCEDURE. A study of the adjudication of civil cases with special emphasis on the Federal Rules of Civil Procedure. Three hours a week throughout the year. MR. PASCHAL

EVIDENCE. A study of the common-law rules of evidence, including the requirements of relevancy and materiality; competency and privilege of witnesses, examination and cross-examination, burden of proof and presumptions, judicial notice, and functions of judge and jury. Three hours a week first semester. MR. HARDIN

LEGAL PROFESSION. Lectures, discussions, and reading concerning the ethical problems and professional responsibilities of the lawyer. One hour a week second semester. MR. HARDIN

NORTH CAROLINA PRACTICE. A study of the steps in a civil action at law from the issuance of process to the entry of final judgment including service of process; appearance and waiver of process; selecting the jury; various motions made during the trial; submission of case to jury; verdict; judgment; noting and perfecting appeal. Also included are such topics as jurisdiction of various courts in North Carolina; venue; trials without a jury; provisional remedies and special proceedings. Two hours a week first semester. MR. BRYSON

TRIAL PRACTICE. A study of the function of the advocate in the trial of law suits, with emphasis upon methods of pre-trial preparation and development of facts in court, typical uses of rules of procedural and substantive law in trial proceedings, and tactical and ethical aspects of problems which confront the trial lawyer. The course is open to third-year students who have completed the course in Evidence. Two hours a week second semester. MR. HARDIN

Legal Research and Writing

DUKE LAW JOURNAL. One semester-hour of credit shall be accorded for each semester of satisfactory *Law Journal* activity as a competitor or as a member of the Editorial Board other than an officer; two semester-hours of credit shall be accorded for each semester of satisfactory *Law Journal* activity as an officer of the Editorial Board.

RESEARCH AND WRITING. Classroom instruction and individual problems in the use of law books, the preparation of memorandum of law, and moot court briefing and argument. Two semester-hours credit. MR. JOHNSTON

Upon recommendation of the Committee on Graduate Study, seminars not listed in the Bulletin may be created or arrangements made for supervision of special research by individual graduate students in any subject.

All matters presented in this Bulletin are subject to change as the University or the School of Law may deem expedient.

THE SCHOOL OF MEDICINE

First term begins September 7, 1965

Second term begins November 7, 1965

Third term begins January 24, 1966

Fourth term begins March 28, 1966

General Information

The Duke University Medical Center is located on the campus of the University, within the city limits of Durham, and on the border of the Duke Forest. A medical school and hospital as part of the University were conceived in 1925 from the gifts of Mr. James B. Duke. Mr. Duke's Indenture states, "I have selected hospitals as another of the principal objects of this Trust because I recognize that they have become indispensable institutions." An outstanding medical scientist and educator, Dr. Wilburt C. Davison, was appointed as the first Medical School Dean. He organized the Medical Center and directed it through the formative years.

Duke Hospital was opened for patients on July 21, 1930. The first medical students were admitted October 2, 1930, beginning both a first and a third year class. The first student nurses began their studies January 2, 1931. Through the years, an extensive building program has been necessary, with construction of additional facilities for clinics, wards, classrooms, research laboratories and dormitories.

The aims of the school have remained basically the same: the development of informal and cordial student-faculty relations, emphasis on the importance of sound teaching and good medical care, the continued acquisition of new knowledge, a mutually helpful relationship with the medical profession, and service to the people of the communities of this area.

FACILITIES

University Facilities

The Medical Center is a part of the Duke University campus which provides to the students of the Medical School easy access to all the facilities of the University. These include the dormitories, dining halls, libraries and all recreational facilities. For example, the tennis courts and gymnasium are only a short walk in distance and the Sarah B. Duke Memorial Gardens are directly opposite the Medical Center.

Duke Hospital

Duke Hospital is an integral part of the Medical Center and currently has 650 beds and 30 bassinets. The hospital performs the dual functions of professional education and patient care. Comprehensive diagnostic and treatment facilities are provided. Different levels of patient care are provided, ranging from the intensive nursing unit,

through the conventional nursing sections to a minimal care unit. Private, semiprivate and ward accommodations are available. Over 20,000 patients are admitted each year. The approximate daily census by service is as follows: Surgery, including the surgical subspecialties, 250; Medicine, 160; Pediatrics, 55; Psychiatry, 45; and Obstetrics-Gynecology, 45. Surgical facilities include 18 operating rooms where over 15,000 surgical procedures are performed annually. Two obstetrical delivery rooms are maintained. Special diagnostic and treatment units are also available such as the recovery room, cardiac catheterization laboratory, and hyperbaric oxygenation chamber.

The out-patient services comprise the public clinics, the private patient clinics and employee health office, and the emergency service. Over 130,000 visits are made each year to these units. Close working relationship between Duke Hospital and various outside health agencies enhance continued care of the patients.

The clinical faculty of the Duke University School of Medicine forms the medical staff of Duke Hospital. Thus this group not only participates in both undergraduate and graduate medical education but also in active medical practice within the hospital and the private diagnostic clinics. Duke Hospital is approved for internship and residency training by the Council on Medical Education and Hospitals of the American Medical Association and conducts an active educational program involving approximately 300 housestaff members. The hospital is fully accredited by the Joint Commission on Accreditation of Hospitals.

Teaching and Research Facilities

Classroom and laboratories for clinical teaching are located throughout the Duke Hospital patient areas. The major preclinical teaching facilities are in the Medical School Unit, the Davison Building, which is physically a part of the hospital. Additional teaching and research facilities are located in the Diagnostic and Treatment Building, the Gerontology Building, the Clinical Research Building, and the William B. Bell Research Building. All except the latter are a part of a single building complex.

Veterans Hospital

The Durham Veterans Administration Hospital is located within walking distance of the School of Medicine. The fulltime professional staff are all members of the faculty of Duke University School of Medicine. This 489 bed general hospital provides an opportunity for closely integrated student teaching and housestaff training.

LIBRARY

The Medical Center Library, located in the Davison Building, attempts to provide all services and collections necessary to further educational, research and clinical activities in the medical field. Extensive reference and bibliographical service is provided. The collection exceeds 70,000 volumes and about 1300 current periodicals are being received, over one hundred of them in duplicate subscriptions.

The Trent Collection in the history of medicine is an unusually fine one, rich in manuscripts and rare books, and providing opportunity for study and research as well as casual reading in the field.

CENTRAL TELEVISION FACILITY

The functions of this unit include television service directed toward the instruction, research, and patient care programs of the Medical Center. Another function is that of conducting continuing research in evaluation studies and in the development of television utilization. A collection of videotaped material is available as cores for teaching presentations. The television system is designed to enhance the multimedia approach for instruction. The television control center is capable of interdigitation of all audio and video signals originating from TV cameras, a motion picture-opaque-slide pick-up device, and videotape recorder. Mobile cameras, monitors (receivers), and the wide-screen TV projector may be used in 21 specific locations throughout the Medical Center. These locations include all major classrooms. With the use of extension cables, other locations may be reached. Four-channel capability is a built-in feature of the system. Although no formalized study in educational television is provided, individual training programs are available for those who wish to pursue medical television as a career. Consultation and training programs are designed for those who wish to utilize television in their professional activities.

LIVING ACCOMMODATIONS

The Men's Graduate Center, within a block of the Medical Center, is available to men enrolled in the Medical School. The rooms are furnished for two persons, and the rental charge for a double room is $520.00 for the academic year (4 terms) or $260.00 for each occupant, or $65.00 each occupant per term.

Epworth Hall on the Woman's College Campus and Hanes House on the Duke University Campus are available to women enrolled in the Medical School. The rental charge for a single room in Epworth Hall is $340.00 for the academic year or $85.00 per term. The rental charge

for a double room is $570.00 for the academic year (4 terms) or $285.00 for each occupant, or $71.25 each occupant per term. There are no single rooms for medical women in Hanes House. The rental charge for a double room in Hanes House is $590.00 for the academic year (4 terms) or $295.00 for each occupant, or $73.75 each occupant per term.

Duke University Apartments, which consist of efficiency, one-, and two-bedroom apartments, are available to married graduate students. The apartments are complete with basic furnishings, and the rental charges per month are $70.00 for the efficiency, $80.00 for the one-bedroom, and $90.00 for the two-bedroom. Heat, electricity except for window fans and air conditioners, hot and cold water, garbage and trash collection, and maintenance of grounds are all included in the rental charge. For further information on married student apartments, write to the Housing Bureau, Duke Station, Durham, North Carolina.

Regulations

Residence hall rooms and Duke University Apartments may be reserved by new applicants only if they have been accepted officially for admission to the School of Medicine. Applications for residence halls rooms are to be made to the Housing Bureau, Duke Station, Durham, North Carolina. A $25.00 room deposit is required of each applicant before a residence hall room reservation is made. The initial room deposit is effective in making room reservations for each term of continuous residence. In the event that a student moves out of the residence hall for as much as one term, the initial deposit may no longer be used to reserve a room, except when residence away from the residence hall is a normal part of the academic program approved by the Dean of the School of Medicine. The deposit will be refunded under the following conditions:

a. Within thirty days after the student has been graduated provided written notice is received at the Housing Bureau requesting refund.

b. Upon withdrawal from Duke University residence halls by students enrolled on the semester basis, provided written notice is received in the Housing Bureau by August 1st for cancellation of a reservation for the fall semester, and not later than January 15th for cancellation of a reservation for the spring semester.

c. Upon withdrawal from Duke University residence halls by students enrolled on the basis of the medical term, provided written notice is received in the Housing Bureau by August 1st for cancellation of a reservation for the term beginning in September, and not later than ten (10) days prior to the beginning of any subsequent medical term within the academic year.

d. When the reasons requiring withdrawal are beyond the student's control.

No refund will be made until the occupant has checked out of his room through the Housing Bureau and has settled his account with the Bursar.

A resident student, in order to retain his room for the succeeding academic year, must make application at the office of the Housing Bureau for confirmation of his reservation.

The authorities of the University do not assume responsibility for persons selected as roommates. Each student is urged to select his roommate when the room is reserved. Any student who occupies a double room without a roommate will be given written notice from the Housing Bureau to obtain a roommate or he may be required to pay the rental consideration for the whole room.

Any exchange of rooms must be made at the Housing Bureau. Persons who exchange rooms without the approval of the Housing Bureau will be subject to the charge for both rooms.

Rooms are rented for the academic year but for no period of less than one term without special arrangements. After the day of registration, no refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

Regulations governing the occupancy of rooms will be supplied by the Housing Bureau to those students who make application for housing. Occupants are expected to abide by these regulations.

The dining facilities in the Men's Graduate Center, Duke University Union, and the Woman's College Union are available to students of the Medical School. The cost for the academic year ranges from $450.00 upward, depending on the individual.

STUDENT MEDICAL CARE

With the exceptions noted below, full medical and surgical care is furnished to all regularly matriculated medical students of the University who have paid the quarterly General Fee. This service is under the direction of the Physician-in-Charge with the co-operation of the staff of the Duke University Medical Center. It includes hospitalization (limited to thirty days), medical and surgical care, drugs, dressings. x-ray studies, and ward but not special nursing. A charge for board is made at the same rate as in the University dining halls. Refraction of eyes and treatment of teeth and of all chronic and pre-existing conditions, such as diseased tonsils, hernia, elective surgery, chronic skin conditions, endocrine disturbances, etc., or accidents or illnesses occurring during vacations or while off the campus are not included in this

service. The cost of any necessary braces and orthopaedic appliances, as well as of special nursing must be borne by the patient. If the student has insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of his medical care.

MOTOR VEHICLE REGISTRATION

Each motor vehicle operated on the campuses by students enrolled in the School of Medicine must be registered at 05 Allen Building within 5 days after arrival, and thereafter must display the proper registration emblem. To register a vehicle, the student must present the following documents:

1. State vehicle registration.
2. State operator's license.
3. Evidence of automobile liability insurance as required by North Carolina law: $5,000 per person and $10,000 per accident for personal injuries; and $5,000 property damage.

Parking, Traffic, and Safety Regulations will be given each student who registers his vehicle. Students are expected to abide by these regulations.

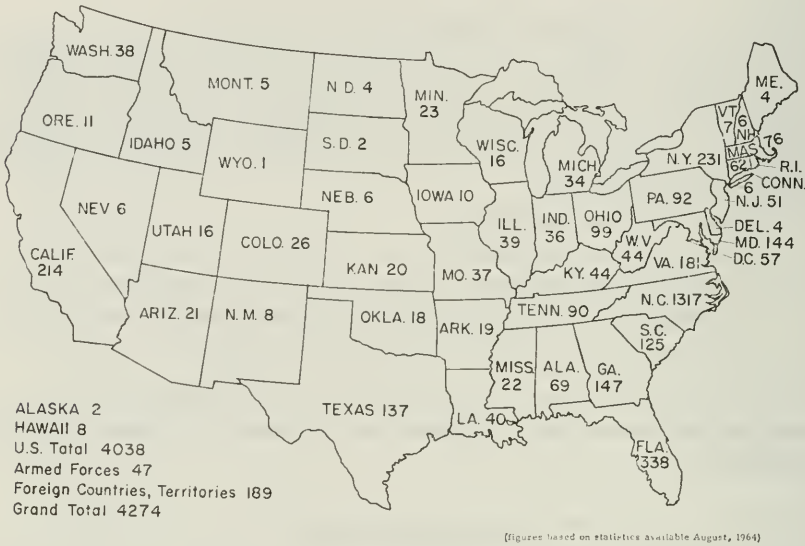
ORGANIZATIONS

Duke University Medical Alumni

The Duke Medical Alumni now number over 4,200. Membership includes all graduates of the Medical School (total through 1964 was 2,250), past and present faculty, all past and present house-officers of Duke Hospital (including the 2,224 who are not Duke graduates); making a grand total of 4,274. Associate membership is held by alumni of the following Paramedical Services: Hospital Administration, Dietetics, Social Service, Laboratory Technique, X-Ray Technology, Physical and Occupational Therapy, Medical Record Library, and Medical Art and Illustration.

A newsletter is sent to all the members in January, April, July, and October of each year. Reunions are held every year in Durham, the next is planned for 1966. Alumni groups have been formed in several states. Alumni luncheons or dinners are held during the following meetings: The American Medical Association, The Southern Medical Association, The North Carolina Medical Society, and the American Academy of Pediatrics. The map shows states in which Duke Medical Alumni are located and the number in each state. Figures include those who received the M.D. degree from Duke and also those who

have served a year or more on the housestaff. Not shown are the 189 physicians serving in the territories of the U. S. and in foreign countries and 47 on duty in the Armed Forces overseas.* A total of 4038 physicians are distributed throughout the United States.



* Afghanistan, one; Australia, two; Belgium, three; Brazil, seven; Canada, twenty-eight; Chile, eight; China, one; Colombia, ten; Cuba, four; Denmark, one; Egypt, one; Formosa, nine; France, three; Germany, three; Greece, one; Guatemala, five; Iceland, three; India, five; Iran, three; Iraq, one; Ireland, one; Italy, one; Jamaica, B.W.I., one; Japan, eighteen; Jordan, two; Kenya, one; Korea, four; Lebanon, one; Malaya, one: Mexico, seven; Nigeria, one; Norway, two; Panama, four; Paraguay, one; Peru, two; Philippine Islands, six; Puerto Rico, three; Rhodesia, one; Scotland, one; South Africa, two; Sweden, three; Switzerland, two; Thailand, six; United Kingdom, twenty-two; Venezuela, five; Virgin Islands, one.

Student Government Association

The Student Government Association is composed of 16 elected members of the student body: three officers, three representatives from each class, and the President of SAMA or his appointee. Responsibilities of the SGA include indoctrination of the freshman advisory council, publication of the school yearbook, participation in the Davison Scholar Program, and organization of social events.

A major responsibility of the SGA is the review of disciplinary matters brought to its attention through its role as the Honor Council. The development of character and thoughtful consideration of responsi-

ble action are enhanced by several measures during medical school, and one of these is the Honor System. A level of acceptable conduct exists in most fields of endeavor, but the level must be particularly high for the physician. At Duke, any person who fails in this respect must answer to the Honor Council and to the administration.

The Duke SAMA Chapter

Representing 75% of the medical student body, the Duke Chapter of the Student American Medical Association is a service organization interested in a wide spectrum of activities. SAMA is a national organization which represents the opinions and desires of the future physicians of America.

Chartered only recently, the organization has earned a reputation for its interest in medical recruitment in conjunction with the admissions committee, a summer externship program, a directory of the medical center, a listing of research opportunities for medical students and many other service projects. The Duke Chapter has been very active in the national organization.

Admission

Intelligence, character and integrity are the essential qualifications for admission.

A premedical student should be aware of the importance of a well-rounded general education as a preparation for the study of medicine and not limit himself to scientific courses. The Admissions Committee believes that the manner in which the college years are utilized is of greater importance than the specific subjects taken. The premedical student would be better advised to secure a knowledge of the principles and a thorough appreciation of the interrelations of the basic sciences than to accumulate credits in many courses. He should learn how to work independently, to observe critically and to analyze rather than merely to store the information presented. Good study habits and use of time are perhaps the most important tools a student can bring to the study of medicine. His choice of studies beyond those required for admission should be governed by his own chief interests and by the intellectual stimulus to be derived from the work.

APPLICATION FOR ADMISSION

Application forms may be obtained by writing to the Director of Admissions, Box 3710, Duke Hospital, Durham, N. C. Please do not send a request before August 1. Formal applications will be accepted by the Committee on Admissions only between 1 August and 1 December.

Due to the large number of qualified applicants to all medical schools, each student is urged to apply to at least four schools.

REQUIREMENTS FOR ADMISSION

1. A minimum of ninety semester hours of approved college credit is necessary for admission to the School of Medicine. These must include:

   A. Two years of English. The second year should be chiefly expository English composition.
   B. Two years of chemistry. The first year should be inorganic and the second analytic and organic.
   C. One year of physics.
   D. One year of biology and/or zoology.
   E. One year of mathematics.

Strongly recommended courses but not absolutely required:

F. Embryology.
G. Calculus.
H. Genetics.

All science requirements must be completed not more than seven years prior to entrance.

2. Medical College Admission Test. This test is required of all applicants. It is administered by the Psychological Corporation, 304 E. 45th St., New York 17, New York. This test is given at many of the colleges throughout the country in May and October of each year. Arrangements for taking this test should be made by the student through his premedical advisor.

SELECTION

Selection is made between September 15 and February 15 for the student entering the following September. The data on each candidate are carefully screened by the Committee on Admissions. A personal interview will be arranged for those with satisfactory credentials. If the distance from Durham is permissible the interview is conducted here; otherwise the candidates are referred to our regional representatives. Many factors are evaluated by the Committee in the selection process. Those students who show the most promise for exceptional performance in their future practice of medicine are admitted. The candidate is notified as soon as possible whether or not he has been accepted. If he has been accepted it is necessary to send a deposit of $50.00 by the succeeding January 15 in order to insure enrollment. This deposit is applied toward tuition and is refundable upon withdrawal prior to January 15. Inasmuch as admission must be offered a considerable period in advance of matriculation the admission must be provisional upon the successful completion of the remaining college work. In addition, a physical examination is necessary prior to enrollment.

TRANSCRIPTS

A student who wishes to transfer his credits to another institution should direct his request to the Recorder, Duke University School of Medicine. Transcripts are furnished without charge.

ADVANCED STANDING

Applications for transfer into the second and third year classes will be considered only if space permits. No application for entrance to the fourth year will be considered. For entrance into the third year, Part I of the National Board Examination will be required as evidence of satisfactory accomplishment in the subjects of the first two years.

A limited number of transfer students from foreign medical schools may be admitted each year. Such students will be admitted into the third-year class in January only. A faculty committee will plan the program for each student on the basis of his needs and interests. By attending two summer sessions, a transfer from a foreign medical school can receive his M.D. degree from Duke University approximately two and one-half years after matriculation.

SUMMARY FOR APPLICANTS

Years of College work required	3
Tuition and fees for first year	$1412.00
Estimated cost of equipment first year	$ 265.00
Estimated room and board	$ 860.00
Non-refundable application fee	$ 10.00
Deposit required on or before January 15, 1966 from accepted applicant	$ 50.00
Medical College Admission Test required	Yes
Size of 1965-66 first year class	80
File application for admission between	August 1, 1965 December 1, 1965
Notification of action on application between	October 1, 1965 February 15, 1966
Date entering class starts school	September 6, 1966

Financial Information

FEES AND EXPENSES

Listed below is a table of the approximate expenses for the normal four term academic year of the School of Medicine:

Tuition and fees	$1412.00
Board	600.00
Room	260.00
Books	135.00
Laundry	100.00
Insurance, instruments and incidentals*	160.00
	$2667.00

One fourth of the total fees is payable by the Friday preceding each nine-week term. A fine of $5.00 is charged for late registration after this time. No credit will be given for any term in which the tuition has not been paid, whether the work has been done here or elsewhere.

It is not advisable for students to attempt outside work to defray their expenses during the academic year.†

AVAILABILITY OF FINANCIAL ASSISTANCE FOR MEDICAL EDUCATION

With the increasing cost of medical education, the need has also increased for financial assistance to deserving students. Three kinds of aid are currently available: scholarships or fellowships; loans; and cash awards. Where not stated, information concerning these may be secured from the Office of the Dean.

SCHOLARSHIPS—FELLOWSHIPS

THE CHARLES ALVA STRICKLAND MEMORIAL FUND SCHOLARSHIPS may cover up to full tuition costs. This scholarship may be renewed for each of the years after the first year. Merit and need are taken into consideration.

THE DR. HILLORY M. WILDER SCHOLARSHIP FUND covers full tuition for each of four years and is awarded on the basis of merit and need.

* Microscope, sphygmomanometer, ophthalmoscope, otoscope, and other equipment, which are required of each student and which must conform to rigid standards, may be obtained at the University through a special payment program.

† Wives of medical students desiring employment may secure information from the Duke Medical Center Personnel Office or the Duke University Personnel Office.

THE DUKE MEDICAL SCHOOL ALUMNI SCHOLARSHIPS are awarded to outstanding students, irrespective of financial need. These honorary scholarships carry an annual stipend of $500.00 per year for each of four years.

THE PFIZER Scholarship, offered by Pfizer Laboratories, A Division of Charles Pfizer & Co. Inc., is an award of $1,000 granted to a student selected on the basis of merit and need.

THE MANOOCHERIAN-ROBBINS FOUNDATION SCHOLARSHIP of $500.00 for one year is granted to one outstanding student each year. This award is made as a supplement to a student who has already been awarded some other scholarship aid.

STUDENT RESEARCH FELLOWSHIPS are available as part of an extensive program designed to encourage the medical student to participate in research. Summer Fellowships carry a stipend of $200.00 per month. These Fellowships enable selected students, after completion of their first year, to participate in research during a summer vacation or other free time. Special Fellowships in Nutrition, Ophthalmology, Allergy, and other fields are also available. Opportunities also exist for a student to engage in research for an entire year during which time he temporarily discontinues his medical course. These Post-Sophomore Research Fellowships carry a stipend of $3200 per year plus an allowance for dependents and tuition expenses. In special circumstances these Fellowships are tenable at institutions other than Duke Medical Center and outside the United States. Information may be obtained from the Assistant Dean for Medical Student Affairs.

THE WILBURT C. DAVISON SCHOLARSHIP was instituted to enable a medical student to widen his experience by clinical study outside of the United States. One award of $500.00 is made each year. Information may be obtained from the Assistant Dean for Medical Student Affairs.

LOANS

Loan funds are administered in accordance with the following regulations:

1. Loans will be made only to students who are taking full courses of study that lead to a degree. All loans except the Swett Fund must be arranged not later than July 1 of each year.
2. Every applicant for a loan must present with the application such security as the President of the University may approve, and no money will be advanced before a note with approved security is in the hands of the Treasurer of the University.

THE ANGIER B. DUKE MEMORIAL FUND covers amounts up to full tuition for each of four years.

THE W. K. KELLOGG FOUNDATION FUNDS are available for amounts up to full tuition for each of four years.

THE FRANCIS AND ELIZABETH SWETT FUNDS are immediately available to students with emergency need. These loans are usually small, on a short-term basis.

THE JAMES L. CLARK MEMORIAL FUND provides financial aid to needy students who are outstanding in merit and dedication.

NORTH CAROLINA STATE LOANS are available to worthy students who agree to practice in a North Carolina rural area or small town of less than 2500 population for at least four years after the completion of their professional training. To be eligible a student must have been a resident of North Carolina for the past eight years. The maximum loan to a medical student is $1,400.00 per academic year ($5,600.00 for a four year period). The student who receives a loan must, immediately following completion of the four year medical course, take a rotating internship of one year and if approved by the Medical Care Commission, he will have the option of continuing the internship through a second year. Detailed information can be obtained from the North Carolina Medical Care Commission, Post Office Box 1880, Raleigh, North Carolina.

HEALTH PROFESSIONS STUDENT LOAN FUND was created by federal legislation and funds have been allotted to Duke University School of Medicine. Long term loans are made at favorable interest rates. Detailed information may be obtained from the Program Representative, Dr. Joseph E. Markee.

CASH AWARDS

THE BORDEN UNDERGRADUATE RESEARCH AWARD IN MEDICINE is an award of $500.00 to be given to the Duke senior who, on the recommendation of the Award Committee, has performed the best research work during his or her entire medical course, including that done during the preclinical years. Applicants should submit their papers, articles or reprints to the Dean at least three months prior to expected date of graduation.

THE TRENT PRIZE IN THE HISTORY OF MEDICINE was established by Mrs. Mary Trent Semans in memory of the late Dr. Josiah C. Trent, to encourage students to undertake independent work in the history of medicine and to utilize the resources of the Trent Collection.

An annual award of $100.00 is offered for the best essay by a Duke medical student on any topic in the history of medical and allied sciences. An additional book award will be made to each entry of merit. Students are invited to discuss possible topics with the Curators of the

Trent Collection. Finished papers must be submitted to Mr. G. S. T. Cavanagh, Medical Center Library, by October 31 of each year.

THE ROBERT U. YOUNG AWARD was established by friends and classmates of the late Robert U. Young (M.D. '51). An outstanding second year student, selected by the Dean, receives all of the basic equipment needed except for the microscope.

Curriculum

In recent years, analysis and appraisal of the curriculum in medical schools has caused changes in many. Several factors have required these changes, important among them being the increasing scope and complexity of medicine generally, and the dissatisfaction with the sharp cleavage between basic science and clinical years. As a result of long study, the Duke University School of Medicine will have a major revision of the curriculum which will begin with class starting in the Fall of 1966.

The aims of the new curriculum are: (1) to provide a strong academic basis for a lifetime of growth within the profession of medicine, with the development of technical competency, proficiency, and the proper attitudes peculiar to the practice of medicine as well as appreciation of the broader social and service responsibilities; (2) to establish for the first year a basic science program which will fulfil the purposes of the increasingly heterogenous student body; (3) to offer both clinical and basic science education simultaneously; (4) to permit the student to explore his personal intellectual preferences and capabilities; (5) to allow study in depth in selected areas, either clinical or basic science; (6) to provide greater freedom of course selection and thus to encourage earlier career decision; (7) to achieve better integration of the medical school curriculum with residency training and the practice of medicine.

FIRST YEAR

The student will study the basic principles of all the preclinical disciplines. Rather than mastering an encyclopedic array of facts, the purpose will be to acquire familiarity with the major principles of each subject. As an introduction to medicine, physical diagnosis and clinical microscopy will be presented by the clinical services. The year will be divided into two terms, each of eighteen weeks, as follows:

Term I	*Hours*
Anatomy	252
Biochemistry	205
Physiology	205
Genetics	36
Psychobiology	11
Free Time (Study, etc.)	92
	801

Term II

Pathology	235
Microbiology	168
Pharmacology	139
Psychobiology	49
Physical Diagnosis	54
Clinical Microscopy	54
Preventive Medicine	35
Free Time (Study, etc.)	67
	801

SECOND YEAR

The second year will provide an extensive exposure to all of the major clinical disciplines permitting the student early in his career to become a participant in the care of patients. The acquired appreciation of the problems of the clinical areas and the opportunities to recognize the applications of the basic sciences should lead to a more meaningful selection of courses for the subsequent two years. The second year will be divided into five terms of seven weeks each as follows:

Medicine	7 weeks
Obstetrics	7 weeks
Pediatrics	7 weeks
Psychiatry	7 weeks
Surgery	7 weeks

THIRD AND FOURTH YEARS

These two years will be made up of elective courses, as flexible as possible within requisite limitations. Each student will have two advisors, one from the preclinical and one from the clinical faculty. These advisors, with the Office of the Dean, will assist the student in formulating his program for the third and fourth years. Maximum and minimum course load requirements will be established. Approximately one-half the time will be spent in basic science and one-half in clinical science. The student will be advised to spend substantial time in medicine and surgery. Completion of the Medical Research Training Program may fulfil the requirements for basic science.

The elective courses of study offered are described under each department. The combinations are too varied to be enumerated. The wide selection, however, affords an opportunity for each student to design his program to satisfy best his needs in conformity with his medical future.

As an alternative after completion of the second year, the student may enroll as a Ph.D. candidate in one of the basic sciences, earning this degree in two or three years. Then, having completed three of the four years necessary for an M.D., he may earn the M.D. degree by completing a fourth clinical year.

The third and fourth years will be divided into four quarters of nine weeks each. Certain courses as noted will be offered during the summer term.

PROMOTION

The records of each student in the first and second years are reviewed periodically by special Promotion Committees, which are made up of the preclinical Department Chairman. The Medical School Advisory Committee acts on recommendations from these Promotion Committees and may:

1. Promote to the next year those students whose work is good.
2. Warn those students whose work is below average that they must improve their scholastic endeavor.
3. Place on probation those students whose work is not good.
4. Request the resignation of any student who is considered an unpromising candidate for the degree of Doctor of Medicine.

A student wishing to appeal this decision may do so to the Chairman of the Committee on Health Affairs within two weeks of his notification.

The Medical School Advisory Committee reserves the right to require the withdrawal of any student at any time if, in the opinion of the majority of its members, he should not continue his course.

At the end of the second year each student will be required to take and pass Part I of the National Board Examinations.

DEGREES

DOCTOR OF MEDICINE. The degree of Doctor of Medicine is conferred on those students who have completed the curriculum of the School of Medicine to the satisfaction of the Medical School Advisory Committee.

BACHELOR OF SCIENCE IN MEDICINE. The degree of Bachelor of Science in Medicine is conferred upon those students who have fulfilled the following requirements: 1) Completed two academic years at the Duke University School of Medicine with performance in all courses at the level of "Good" or better, 2) Obtained approval of a research program to be conducted under the sponsorship of a faculty member and with the consent of the head of the department in which the work is to be done, 3) Obtained written permission from the Dean's Office, 4) Completed creditable, original investigative work under the supervision of an advisory committee of which the faculty sponsor will be chairman and appointed by the chairman of the appropriate department, 5) Completed a written report in the form of a thesis meeting the

requirements of the Graduate School of Arts and Sciences and which has been accepted by the advisory committee following an oral examination, 6) Submitted one bound copy and two unbound copies to the Dean of the School of Medicine at least two months prior to the expected date of graduation.

No credit toward this degree is given for additional college work. All students in good standing are encouraged to undertake work towards this degree in addition to their work toward the degree of Doctor of Medicine. Application should be made to the Assistant Dean for Medical Student Affairs for guidance in establishing the program and for aid in fulfilling these requirements.

Departments of Instruction

ANATOMY

The core course of instruction in human anatomy will constitute about 252 hours during the first 18 weeks of the first year. The gross anatomy of the head, neck and trunk will be studied during the first 14 weeks, histology during the first 9 weeks, neuroanatomy during the 10th to 18th weeks. The gross anatomy of the back, pectoral and pelvic girdles and the limbs will be studied during the 15th to 18th weeks. All of the above will be integrated with the other material studied during the first year. Emphasis will be placed upon the study of the material in the laboratory. In an attempt to utilize more fully the laboratory time, audio-visual education methods will be employed as fully as possible. These techniques will consist of color motion pictures of demonstration dissections, closed-circuit television, color lantern slides, and motion pictures, both embryologic and neurologic. All of the instruction is designed to be as informal and as nearly individual as possible. General principles and the functional viewpoint of living anatomy will be stressed in the hope that the student may be stimulated to secure a working knowledge of anatomy in the broadest sense. Whenever possible, fresh tissues and living cells will be made available for examination. Patients exemplifying anatomical principles will be presented, some within the classroom, others over live television, and others pre-recorded on videotape for later presentation at the appropriate time in the students' learning experience. Through the cooperation of the Department of Radiology, the students will be given an opportunity to study portions of the living human body as revealed by the fluoroscope and roentgenograph.

In gross anatomy all of the students will dissect the important structures in certain areas of the body; namely, within the neck, thorax, abdomen and pelvis. In other regions the students will do little or no dissection but will instead view prosections as well as pre-recorded TV programs and motion pictures. The regions that will be presented in this manner include the back, the pectoral and pelvic girdle, the limbs, the interior of the cranium, including the gross anatomy of the ear and orbit and the oral and nasal passages and the paranasal sinuses. The general principles of programmed learning will be utilized even more extensively than in the past few years.

In microscopic anatomy the students will be introduced to electron-microscopy and the teaching will be focused on the cell, its generalized

structural and functional organization and its differentiation in various organs and tissues. The students will be introduced to biochemical cytology and to biophysical cytology and cytological genetics.

In neuroanatomy the students will be introduced to neurocytology and nerve cells and glia. The major part of the course will deal with; a) the spinal cord, including the ascending and descending and associative tracts, b) the brain and brain stem and cranial nerves 3 through 12, c) the autonomic nervous system, d) the cerebellum and brain stem and reticular formation, e) the thalamus and hypothalamus, f) the cerebral cortex, including its structure and blood supply and primary pathways, g) the somatic sensory and the motor systems, as well as the visual and auditory and olfactory and limbic systems. There will also be clinical neurology presentations of suitable patients.

The students will spend about 92 hours in gross anatomy, about 80 hours in microscopic anatomy and about 80 hours in neuroanatomy.

GROSS ANATOMY

Courses in Anatomy Offered During the Third or Fourth Years.

ANATOMY AS RELATED TO LOCOMOTION. Complete dissection of that part of the body concerned with locomotion and posture; namely, the back, the pectoral and pelvic girdles and the superior and inferior extremities. Visual aids of all kinds will be used extensively, including motion pictures, pre-recorded TV presentations and lantern slides. This course will be designed to meet some of the needs of Ph.D. candidates in anatomy, as well as students interested in general practice, orthopaedics or neurosurgery. Prerequisites: either the core course in anatomy or anatomy 205 which may be taken concurrently. 4 units of graduate credit. (18 lecture hours and 171 hours of laboratory work, from February to June.) Drs. Markee, Everett, Becker, Duke and Bassett. (This course is currently listed in the bulletin of the Graduate School as M201.)

ANATOMY OF THE VISCERA. This is a study of the anatomy of the thoracic, abdominal and pelvic organs. Emphasis will be primarily upon the anatomy of these viscera and their blood supply, and innervations and relationships. This is primarily a laboratory course, but the dissections will be augmented by extensive use of prosections, motion pictures and pre-recorded TV presentations. This course is designed for Ph.D. candidates in anatomy as well as for future general practitioners and specialists in internal medicine. Prerequisite: core course in anatomy. 2 units of graduate credit (18 lecture hours and 72 hours of dissection from February to June). Drs. Markee, Everett, Becker and Duke. (This course is listed in the Graduate School Bulletin as M205.)

ANATOMY OF THE INTERIOR OF THE CRANIUM AND DEEP FACE. This course will deal with: a) the interior of the cranium and the ear,

eye and orbital contents, b) deeper structures of the head, including the brain and its blood supply and venous drainage, c) deeper structures of the head, including the nasal and oral cavities as they are related to the pharynx, and d) paranasal sinuses. This course is designed to meet the needs of the Ph.D. candidates in anatomy as well as the needs of general practitioners and the specialists including neurosurgeons, clinical neurologists and specialists in ear, eye, nose and throat. The major emphasis will be on gross dissections. Visual aids of all types will be utilized extensively, including a unique collection of lantern slides acquired during the last 15 years, as well as pre-recorded TV presentations acquired more recently. Prerequisites: the core course in anatomy or the equivalent. 2 hours graduate credit (18 hours of lectures and 72 hours of dissection from February to June). Drs. Markee, Everett, Duke, and McFalls.

Special Dissection of a Restricted Region. This course is designed for any group of students with a special interest. For example, the heart and its anatomical characteristics and relationships or in some other region. This course will be planned for the individual needs of the group of students requesting the course. Prerequisites: Core course in anatomy. Units of credit may vary from 1 to 3. Conference hours should total about 18 and laboratory hours totaling 36 to 72. Drs. Markee, Everett, Duke, and Bassett. (This course is currently listed as M312.)

Neuroanatomy

Laboratory Work and Special Neuroanatomy. This course will involve laboratory work and conferences on special areas of the human central nervous system. One course will be available per year and will be made available to the 5 to 10 students who can agree upon a single discrete area of this advanced instruction in neuroanatomy. The areas of choice will be the following: a) the brain and brain stem and cranial nerves 3 through 12, b) the autonomic nervous system, c) the cerebellum and brain stem and reticular formation, d) the thalamus and hypothalamus, e) the cerebral cortex, including its structure and blood supply and primary pathways, and f) the somatic sensory and the motor systems, as well as the visual and auditory and olfactory and limbic systems.

This course will be designed for graduate students and for medical students who intend to specialize in neurosurgery or clinical neurology, or in ear, eye and throat with a special concern in the nervous system. This course would also be suitable for those few psychiatrists who have a real interest in certain parts of the central nervous system. 2 units of graduate credit (18 conference hours and 144 laboratory hours from February to June). Dr. Peele.

NEUROENDOCRINOLOGY-HISTOPHYSIOLOGY OF NEUROENDOCRINE MECHANISMS. This course will consist of conferences and demonstrations and the opportunity for each student to participate in restricted but definitive laboratory experience. This opportunity must be restricted to 10 students who can agree to confine their laboratory work and the conferences to a reasonable number of the subject matters listed below: a) the hypophysis and its relation to the brain: Neurohypophysis; Microanatomy of the median eminence, etc; Neurosecretion; The chemotransmitter hypothesis, with special emphasis on the experimental basis; Pituitary cytology, b) control of adrenocortical secretions, c) control of the thyroid, d) histophysiology of the reproductive tract. Sex cycles, e) control of the day-to-day secretion of gonadotrophins, f) control of ovulation and corpus luteum function, g) control of prolactin secretion. Lactation, and h) neuroendocrine factors in sex differentiation, puberty and senility. Prerequisites: Core course of first year or equivalent. 3 units of graduate credit. (18 hours of conferences and 72 hours of laboratory work.) Drs. Markee, Everett, Peele and Duke.

MICROSCOPIC ANATOMY

GENERAL MICROSCOPIC ANATOMY. This course will deal with biology of cells in tissue culture. It will deal with those areas in cytology that can best be approached by means of tissue culture combined with time-lapse motion picture photography. Examples are: a) the study of cilia and photographic recording of changes in their movement after alteration in the media; b) changes in the cell membrane including the motion picture recording of the passage of substances through the membrane. Prerequisite: The core course in anatomy or its equivalent. 3 units of graduate credit. (18 hours of conferences and 72 hours of laboratory work) February to June. Drs. Moses, Becker, and Cress.

CYTOLOGICAL GENETICS. This course will deal with the organization and functions of chromosomes, nuclei, cytoplasmic genetic structures, protein synthesis and DNA and RNA. Prerequisite: The core course or equivalent. 3 units of graduate credit (18 hours conference and 72 hours of laboratory work) February to June. Dr. Moses.

BIOCHEMICAL CYTOLOGY. This course would deal with microscopical and functional cytochemistry and with correlation of structure with biochemical function. Prerequisite: Core course in anatomy. 3 units of graduate credit. (18 conference hours and 72 hours of laboratory work.) February to June. Dr. Moses.

BIOPHYSICAL CYTOLOGY. The emphasis will be placed on the relation of large molecules to the structural and functional organization of cells; e.g. mitoses, patterns of DNA organization in cells, contractile protein membranes, etc. Prerequisite: Core course in anatomy. 3 units of graduate credit. February to June. Drs. Everett and Duke.

Neurocytology. This course will deal primarily with the neurosecretory process, impulse transmission and with memory. Prerequisite: Core course in anatomy. 4 units of graduate credit. (36 hours of conference and 72 hours of laboratory work.) Drs. Peele, Markee and Duke.

Physical Anthropology. A survey of the major developments of physical anthropology. Human evolution, primate phylogeny, paleontology of man and other primates, primate biochemical genetics, primate behavior, human variation (genetics and somatic) are the principal topics of the course. Prerequisites: core course in anatomy. 3 units of graduate credit. (18 lecture hours and 72 hours of laboratory work.) February to June. Dr. Buettner-Janusch. (This course is currently listed in the bulletin of the Graduate School as Anat. M231 and also as Soc. 231.)

BIOCHEMISTRY

The required course in biochemistry for first-year students is given over a period of eighteen weeks in the first term. The first phase is devoted to a survey of the chemistry of the materials fundamental to all life proteins, fats and carbohydrates, and the nature of enzymatic action. This is followed by consideration of those events in intermediary metabolism common to the life of all mammalian cells. The special metabolism of muscle, kidney, bone, erythrocytes, liver, connective tissue, and the chemical aspects of digestion, respiration, electrolyte, acid-base and fluid balance are presented with relation to the study of the physiology of the organs so as to facilitate integration and correlation of the two disciplines.

Advanced Biochemical Laboratory. This course is specifically designed for third year medical students who select Biochemistry or a closely related area for specialization for the Fall quarter. The laboratory experience will emphasize modern laboratory techniques, such as radioisotope detection, chromatography and spectrophotometry. These techniques will be illustrated by experiments from diverse areas of biochemistry such as lipid metabolism, protein biosynthesis and enzyme kinetics. Students will have the time and opportunity to modify and extend the basic formal experiments. Simultaneous registration in Biochemistry of Disease, Energy Metabolism and Seminar is highly recommended. Sixteen hours per week for 18 weeks, first and second quarters, limited to 20 students. Dr. Lynn, Dr. Rosett and Staff.

Biochemistry of Disease. This course is designed for the third or fourth year medical student who is interested in the primary defect, manifestations and diagnostic aspects of diseases of metabolic or genetic

origin. Examples of emphasis would include a study of the primary defects in diabetes mellitus and other endocrine disorders, disturbances of electrolyte metabolism, genetic lipidoses, etc. Two hours per week for 18 weeks, first and second quarters, limited to 40 students. Dr. Thiers and Staff.

BIOCHEMISTRY-MEDICAL SCIENTISTS SEMINAR. This seminar is designed for the third year medical student who selects Biochemistry for his area of specialization. It will be a cohesive force which will strive to give perspective to the overall third year biochemistry program through student participation and guest speakers. One hour per week for 36 weeks, limited to 20 students. Dr. Byrne and Staff.

CHEMISTRY OF NATURAL PRODUCTS. This is a required course in the Ph.D. program in Biochemistry and is available to all who wish a more sophisticated understanding of the molecular structure, physical and chemical properties of sugars, polysaccharides, fatty acids, simple and complex lipids, steroids, etc. Two hours per week for 18 weeks, first and second quarters, limited to 40 students. Dr. Davidson.

ENERGY METABOLISM. This required course in the Ph.D. program is often selected as part of a minor in Biochemistry. It is a lecture course on the intermediary metabolism of carbohydrates and lipids. Included are detailed consideration of biological oxidations, oxidative phosphorylation and the control of energy yielding pathways. Three hours per week for 18 weeks, first and second quarters, limited to 40 students. Dr. Wakil, Dr. Wheat, and Dr. Fridovich.

NITROGEN METABOLISM. A required lecture course in the Ph.D. program, this course is often selected as part of a minor in Biochemistry. It is devoted to consideration of the biosynthesis of nitrogen-containing compounds including amino acids, purines, pyrimidines and proteins. The fate of preformed or synthesized nitrogen containing compounds is also discussed. Amino acid biosynthesis is used as an opportunity to discuss the control of biosynthetic pathways through enzyme inhibition and regulation of protein biosynthesis. Two hours per week for 18 weeks, third and fourth quarters, limited to 40 students. Dr. Kamin, Dr. Greene, and Dr. Kirshner.

PROTEINS AND ENZYMES. This is a required lecture course in the Ph.D. program. After consideration of the chemical characterization and synthesis of amino acids, peptides and proteins, the theoretical basis and interpretation of physical techniques such as ultracentrifugation, spectrophotometry, titration, viscometry, light scattering, x-ray diffraction, and optical rotatory dispersion as applied to proteins are discussed in detail. After a treatment of enzyme kinetics, enzymes are considered in terms of the mechanism of their action and useful chemical models of enzyme activity. The terminal series of lectures is used

to illustrate current research efforts which are aimed at a molecular understanding of the known physiological properties of selected enzymes and structural proteins. Four hours per week for 18 weeks, third and fourth quarters, limited to 40 students. Dr. Tanford, Dr. Hill, and Dr. Byrne.

Genetics. This is a required course in the genetics Ph.D. program but will also be available to other students. It will be taught by faculty from the genetics division of the Biochemistry Department and will include a comprehensive survey of classical genetics, mammalian genetics, microbial and virus genetics, cytogenetics, population genetics, functions of DNA, functions of RNA and genetic mechanisms. Three hours per week for 36 weeks, limited to 40 students. Dr. Guild and Dr. Gross.

Clinical Chemistry Laboratory. Individual students may participate in the program of the Clinical Chemistry Laboratory. Students must receive the permission of the instructor. Minimum of 20 clock hours per week for 3-9 weeks, limited to 8 students. Dr. Thiers.

Graduate Student Seminar. This is a required part of the Ph.D. program. Each Ph.D. candidate must register for two semesters and he is expected to attend regularly during his entire time in the Ph.D. program. During the first semester students give a seminar on one of a series of related topics under the direction of one faculty member. During the second semester students select their own topics and an appropriate faculty adviser. One hour per week for 36 weeks, limited to 25 students. Staff.

Faculty and Guest Speaker Seminar. During the school year there is at least one seminar per week based on original research by the faculty or invited guests. This is not a formal course, but students are expected to attend.

Research. Students may register for research under the direction of an individual member of the faculty. Permission to register must be sought from the faculty member concerned. The total time, days and hours are by arrangement with the selected research director.

ENDOCRINOLOGY

The Division of Endocrinology was organized by Dr. E. C. Hamblen in 1936 as a division of the Department of Obstetrics and Gynecology. In 1955 it was reorganized as an integrated service with a staff drawn from several clinical and preclinical departments. Its objective is to give comprehensive training in basic and clinical endocrinology and metabolism, particularly at the postgraduate level. Although individual senior staff members have their own special clinical and research programs, the division is organized so that clinics, conferences, ward rounds and seminars are participated in as joint ventures by the entire

staff. The endocrine laboratory and its services are available to all members of the staff equally. Resident physicians from Medicine, Obstetrics and Gynecology and Pediatrics rotate through the Endocrine Division. At any one time there are usually four residents assigned to the division. Clinical and research fellows and trainees are assigned to individual senior staff members, depending on their major interest, but all participate essentially equally in the clinics, teaching rounds, conferences, etc.

The Endocrine Clinic meets four mornings and the Metabolism-Diabetes Clinic one morning each week. All fellows have the opportunity to attend these clinics and in addition the clinical fellows assist in the care of the private patients with endocrine and metabolic disturbances including diabetes. Twice a month the endocrine clinic meets jointly with the neurosurgical tumor follow-up clinic to review patients with pituitary tumors and related brain lesions. Ward rounds on in-patients are held from 4-5 p.m. Monday and Friday and at 9 a.m. on Wednesday each week. An endocrine conference is conducted weekly. In addition, each of the supporting services (Medicine, Obstetrics and Gynecology and Pediatrics) has special conferences, lectures and seminars of endocrine interest which are available to the staff.

MEDICINE

The Department of Medicine traditionally has the responsibility of preparing the student for a lifetime of learning as he gives care to patients who ask him for help. The first step is to begin to think and act like a doctor. Two courses in the first year—Introduction to Clinical Medicine and Clinical Microscopy—prepare the student to take an active role in patient care.

The student assigned to Medicine, or electing Medicine, in the second and fourth years acts in the role of a physician. His desire to give good care is the motive which drives him to excellence. He learns to properly identify the problems of the patient. Having identified the problems, he marshalls the information which he can bring to bear on them by his past training; he recognizes the gaps in his knowledge as he attempts to focus the information learned from the basic sciences onto the specific clinical problem. Using the patient as his means of integration, he continues his reading in anatomy, physiology, microbiology, pharmacology and biochemistry. In this clinical setting he has the opportunity to speak many words which he has previously only read; he discusses the problem with his fellow students, interns, residents and senior staff; he gains familiarity with ideas and concepts by actively manipulating them.

The student crystallizes his idea of the best diagnostic and thera-

peutic approach to this particular patient. He identifies the reasons for each of these decisions. He has real curiosity to see if his evaluation of the situation is correct or if he will have to admit that certain data which he had interpreted as rock-like support for his house of cards have turned out to be shifting sand. He learns that the course of biology is uninfluenced by strong statements, by the rank of the faculty member, or by the number of supporting references not quite applicable to the points in question.

Under guidance from his fellow students and from faculty of all ranks, he slowly appreciates the difficulties of learning in this system of multiple variables operating on only partially defined substrates. Part of a doctor's learning is only experimental. He knows from living with his patients that certain things are possible, but he does not know the underlying sequence of events. In other instances, his learning is more precise because he understands and can control some of the important variables. He must learn both the liabilities and virtues of attempting to use logic in clinical practice.

The goal of the Department of Medicine is for the student to have as many learning experiences as possible in which he plays an active role. We hope that he will enjoy these learning experiences so much that he will continue them as long as he sees patients. We are not interested in covering the entire field of medicine. If one of our graduates meets a new problem, correctly identifies it and has pleasure in solving it, we are satisfied. We are not concerned that a new area of knowledge is being explored without our guidance.

In caring for our patients with ill-defined genetic and acquired differences and with many variables of unknown strength at play, many erroneous conclusions are drawn. The student has to learn to examine statements, both oral and written, with care, and to ask of all authorities the source of data which underlie their conclusions. One way for the student to learn the difficulties in drawing accurate conclusions about biological systems is to give him the opportunity to establish some fact on the basis of his own work. We call this research, and find it a very effective method of teaching. The intellectual discipline involved better prepares him for the role of a lifetime learner.

The health field is a broad one. Anyone with intelligence enough to gain entrance to the Medical School can find an area where he can be happy and productive. We are interested in producing manpower for the entire field. We are not interested in molding our students into any single career in the health field. The faculty accepts the fact that our intake is heterogeneous and that our output will be heterogeneous. Our role is to identify the area where the individual will be most productive and happy, and to help him reach this goal. We will continue to produce general practitioners, specialists, administrators, research

workers, biologists, government workers and various combinations. There is no special honor attached to any of these roles. Our primary interest is that our graduates are productive and receive emotional and intellectual satisfaction from their work.

INTRODUCTION TO CLINICAL MEDICINE. This course is initiated in the first year by introductory lectures, case discussions and instruction in methods by physical examination and history taking. Early in the course, students begin work at the bedside in the examination of selected patients. The emphasis throughout is placed on instruction individually and in small groups. The interpretation and pathologic physiology of abnormal findings are stressed. Instruction in the more specialized methods of examination is provided by coordinating the lectures, case discussions and individual student instruction from the departments of Medicine, Neurology, Obstetrics and Gynecology, Pediatrics, Psychiatry, Radiology and Surgery. In addition, the lectures and laboratory sessions in Clinical Microscopy are coordinated with the over-all program. In the latter part of the year, special emphasis is placed on student correlation of the history, physical finding and pathologic physiology in the individual patient problem.

CLINICAL MICROSCOPY is given in the first year. This course, along with lectures and assignments providing practice in history taking and physical diagnosis, comprises an introduction to medicine designed to equip the student to participate in patient care on the wards and in the clinics. The essentials of hematology are reviewed. Laboratory work includes blood cell counts, the preparation and interpretation of blood films, and the examination of fresh material, such as urine, stools, spinal fluids, sputum, transudates and exudates. This course is supplemented in the clinical years by hematology conferences and by daily ward and laboratory rounds.

SECOND-YEAR MEDICINE. The student spends one term of his second year in Medicine where he is assigned to one of the medical wards or to the medical clinic. He forms part of a medical team composed of interns, first-year residents and senior staff, and takes an active part in the care of patients. The number of patients assigned to him does not vary with the load. He is given this protection to allow him time for synthesis of his basic science experiences with the problems of his patients. When indicated, the undergraduate experiences are integrated with the graduate program. In such an instance, the program of each student is worked out individually.

ADVANCED GENERAL MEDICINE. This course provides advanced training and experience in general medicine. The student is assigned to the inpatient and outpatient services to work up and follow general medical problems in close association with the house staff and consultants. This course will teach techniques of diagnosis and application

of therapeutic programs. The student is responsible for the patient and will learn about disease and its management through the staff directly concerned with the patient, and through the consultant services which will assist in the diagnosis and care. Full-time for 9 weeks. Offered year-round—no limitation on student number. Dr. Stead and Department of Medicine staff.

Allergy and Chest Diseases. This course provides both an introduction and depth in the clinical and laboratory aspects of allergic and respiratory diseases. The student works up and follows the patients assigned to this service in both the outpatient department and in the hospital or in consultation. There is instruction in allergy and clinical immunology with seminars and conferences in more basic immunology in cooperation with the Department of Microbiology and Immunology. The student learns the techniques and interpretations of pulmonary function studies and may attend seminars and conferences in pulmonary physiology in cooperation with the Department of Physiology. Provisions are made for library or clinical research problems. Full-time for 9 weeks. Offered year-round—limited to 6 students. Drs. Sieker, Hansen, Menefee, Kilburn, Saltzman, Buckley and staff.

Courses offered part-time and in coordination with other basic science or clinical areas are: allergy clinic, chest clinic, clinical immunology laboratory, pulmonary function laboratory, allergy and clinical immunology seminar and respiratory disease seminar.

Behavioral Medicine. This course provides training in understanding and applying the principles of human behavior in managing patient problems in general medicine. The student works with and follows patients in the medical outpatient and inpatient divisions, being supervised by the senior staff and associate staff of the division. Emphasis is placed upon interpreting the natural history of illness and the patient's response to the illness, and upon utilizing the features of the individual's behavior as keys to the management of the clinical problem. There is a seminar and patient conference review of the basic science information relative to this area and a series of comprehensive seminars conducted with the departments of Sociology and Psychology. Participation in clinical and laboratory research problems is part of the program. Full-time for 9 weeks. To be offered year-round—limited to 5 students. Drs. Bogdonoff, Klein and staff.

Cardiovascular Diseases. This course is primarily patient-oriented but allows the integration of problems in clinical evaluation and clinical care with those of more advanced laboratory investigation. The curriculum allows the student to develop a continuing relationship with one senior person in the cardiovascular division throughout the entire 9-week period. Since the division does offer a variety of learning experiences, the student may participate also in the forms of investigation

and care which are the particular interests of the individual section of the cardiovascular division. The student is assigned a certain number of patients for evaluation and follows these patients through their specialized study, participating in the phonocardiographic and electrocardiographic studies as well as cardiac catheterization if this is indicated. There are a number of conferences and seminars, including a student working conference in which the student presents and discusses the pertinent data derived on the patients he is following. There is a student seminar in which selected topics are reviewed to provide more completeness and depth in a given area. The student also participates in the scheduled conferences and clinics. Opportunity is provided for participation in related seminars in pathology and physiology. Full-time for 9 weeks. To be offered year-round—limited to 6 students. Drs. Orgain, McIntosh, Floyd, Whalen, Estes, Wallace, Hernandez and staff.

DERMATOLOGY. This course is an introduction to dermatology, with emphasis on diagnosis and management of skin disorders based on the pathophysiologic and biochemical alterations in these diseases. Students are assigned to patients in the hospital and are responsible for their supervised evaluation and care. In addition, the student receives extensive experience in the private and public outpatient departments where he performs diagnostic and treatment procedures under the direction of the staff. Scheduled seminars and conferences provide opportunity for group instruction. Although it is not the major emphasis of the course, interested students may participate in library, clinical or laboratory investigation. Full-time for 9 weeks. Offered year-round—limited to 4 to 8 students. Drs. Callaway, Smith and staff.

GASTROENTEROLOGY. This course is designed to emphasize the role of the gastrointestinal tract and liver in general medical disorders, and to serve as an introduction to illnesses which primarily involve the liver and gastrointestinal tract. Experience is obtained from patients directly assigned to members of the senior staff as well as those seen through the private and staff consultation service in the outpatient gastroenterology clinic. In addition, the student rounds on all patients with the resident, fellow and senior staff. He also participates or assists in the various techniques available in the laboratory for the diagnosis and evaluation of gastroenterological disorders. There are clinical conferences in cooperation with the departments of Radiology and Pathology, weekly seminars concerned with the physiologic and biochemical problems related to hepatic and gastrointestinal function, and the opportunity for library or clinical research in a specific problem. Full-time for 9 weeks. Offered year-round—limited to 4 students. Drs. Ruffin, Tyor, Owen and staff.

HEMATOLOGY (CANCER). This course is intended to provide advanced training in diagnosis and management of hematologic disorders,

including cancer in general. The student works up and follows patients in the inpatient and outpatient services. He participates in the special diagnostic studies and in the laboratory evaluation used in following these patients. There are seminars and conferences and the opportunity for library and clinical investigation in a particular problem area. Full-time for 9 weeks. Offered year-round—limited to 5 students. Drs. Rundles, Laszlo and Mengel.

Metabolism and Endocrinology. The student learns in greater depth the clinical and laboratory diagnosis of metabolic and endocrinologic disorders. He is responsible for the workup and follows patients on both the inpatient and outpatient services. He participates in the special studies and gains experience in managing metabolic disorders under the supervision of the staff. In particular, experience is provided in the endocrinology laboratory and in radioisotope techniques. Full-time for 9 weeks. Offered year-round—limited to 4 students. Drs. McPherson, Nicholson, Wyngaarden and staff.

Neurology. This course is intended to provide experience in the diagnosis and management of neurologic disorders. The student works up and follows patients on the inpatient and outpatient services. Experience is gained in the use of special techniques including electroencephalography. Opportunity is provided for library and clinical research. Full-time for 9 weeks. Offered year-round—limited to 6 students. Drs. Heyman, Pfeiffer, Warner and staff.

Renal Diseases. This course offers detailed instruction in the clinical and laboratory aspects of hypertension and nephrology. It provides the basic foundation for a physiological approach to the diagnosis and management of patients with renal disorders, abnormalities of fluid and electrolyte metabolism and hypertension. The student assumes full responsibility for the complete initial evaluation and subsequent follow-up of both inpatients and outpatients. Through the laboratory facilities, the student becomes familiar with the clinical application of specialized methods for the evaluation of renal function. Active participation in specialty rounds, conferences and seminars is required. Students are systematically introduced to the mechanics and therapeutic applications of hemodialysis and peritoneal dialysis, the diagnostic evaluation of the hypertensive patient, the physiological approach to disorders of fluid and electrolyte metabolism, elements of renal pathology (in cooperation with the Department of Pathology), and medical aspects of urologic surgery (in cooperation with the Division of Urologic Surgery). Although the primary emphasis is on education, the opportunity exists for limited participation in various research projects in clinical dialysis, immunologic aspects of renal disease or transplantation (in cooperation with the Division of Immunology), pathophysiology of renal disease, and the hormonal causes of hypertension. Full-time for 9 weeks. Of-

fered year-round—limited to 4 students. Drs. Robinson, Gunnells, Kempner, Peschel and staff.

These courses may be scheduled to run concurrently with more extensive participation in other areas: hypertension-renal clinic, renal pathology seminar, renal physiology seminar, clinical specialty conferences, and laboratory course.

RHEUMATOLOGY. This course is intended to provide experience in the care of patients with joint diseases. The student is responsible for patient work-up and care under the supervision of the staff. Of particular importance are the laboratory techniques used in evaluating this type of patient problem. Experience is also gained in cooperation with the physical therapy department in problems of rehabilitation. Full-time for 9 weeks. Offered year-round—limited to 4 students. Drs. Persons, Elder, Kerby and staff.

MEDICAL RESEARCH TRAINING PROGRAM

The Medical Research Training Program is an elective program available to qualified students after completion of the first two years of the curriculum, and to members of the Duke Hospital resident staff, Postdoctoral Fellows in the clinical and preclinical departments and qualified graduate students.

The objective of the program is to provide a more sound basis for the future work of those hoping to devote their lives to a career in investigative medicine and biology. Approximately 8 medical students and 8 postdoctoral fellows are accepted annually. Applicants are admitted upon recommendation by a faculty committee on the basis of a past academic performance, evidence of research bent and curiosity, and motivation toward an academic research career.

The program offers an academic year (September to June) of full-time research training in medical sciences basic to clinical investigation, and emphasizes primarily "cell biology." It includes three types of activities: 1) Three months are devoted to an extensive series of laboratory experiences in cytology and fine structure cell and tissue culture, biochemical studies of cell growth, bacterial and phage genetics, protein synthesis and its genetic determination, physical biochemistry of nucleic acids and of proteins including antibodies and enzymes, membrane functions, and organized cellular controls. These three introductory months are designed to familiarize the student with concepts and experimental approaches in these fields, and with the use of important and complex tools and techniques not ordinarily taught in undergraduate courses. 2) Six months are devoted to a research problem conducted either in the general laboratory set apart for this program or in the laboratory of one of the faculty with whom the participant chooses to work. 3) Seven hours per week, throughout the year, are

devoted to class work in mathematics, biostatistics and physics in courses expressly designed for students of this program, and one evening each week is devoted to seminar work. Special lectures are given by guests from the university faculty or from other institutions. The entire program is housed in a special wing of the W. B. Bell Medical Research Building, and is under the direction of members of the faculty who devote themselves largely to this training program.

The qualified medical student can participate in this program without delaying his graduation and without increasing the cost of his education. By using two summers of clinical studies, and by receiving elective credit for two of the four quarters in the training program, he enters his senior year abreast of his class. After the new curriculum begins, this course will fulfil requirements for the third or fourth basic science year. He receives a training stipend of $300 per month during those quarters of the program for which he does not receive curriculum credits toward graduation. He ultimately pays the same tuition as any other medical student.

The Graduate School of Duke University will also accept the total of the first two years of medical school plus participation in this program as residence time toward the degree of Doctor of Philosophy. In addition, the individual student must satisfy the language and dissertation requirements of the Graduate School and any special requirements stipulated by the department in which he elects to obtain this degree. The combined degree program is arranged individually and requires a minimum of 5½ to 6 years.

It is suggested that medical students undertake this program at the completion of the first years of the curriculum and then return to the normal clinical medical curriculum. Such students should also expect to undertake two or more years of a postdoctoral research fellowship in the course of their residency training in order to prepare themselves fully for research oriented career in academic medicine.

MICROBIOLOGY AND IMMUNOLOGY

The required course in microbiology is given in the first term of the second year. An intensive study is made of the common bacteria, fungi, and viruses which cause disease in man. The scope of the laboratory course is reasonably wide and acquaints the student with all the methods and procedures employed in bacteriologic laboratories. Most of the lecture time is devoted to the immunologic and epidemiologic aspects of infection. The instruction is designed to give the students a clear conception of: (1) how organisms gain entrance to the body, (2) the type of poisons which they produce, (3) the nature of the

immune bodies which are produced by the host, and (4) the methods of preventing the disease by active and passive immunization.

The following courses are available as electives for third and fourth year medical students:

MICROBIAL PHYSIOLOGY. A lecture and seminar course devoted to the physiology and comparative biochemistry of micro-organisms. Third quarter. Dr. Burns.

ANIMAL VIRUSES AND ANIMAL VIRUS DISEASES. A seminar course to explore various aspects of virus replication, morphology, immunology and pathogenesis of virus diseases. Fourth quarter. Dr. Osterhout and Dr. Flanagan.

MYCOLOGY. A lecture and laboratory course with emphasis on fungi which cause disease in man and animal. Third and fourth quarters. Dr. Conant.

READINGS IN BACTERIOLOGY AND IMMUNOLOGY. Selected readings will be assigned students for survey and background information with emphasis on recent classical research in the field which has advanced these areas of biology. First and second quarters. Dr. Smith.

PARASITOLOGY. One lecture and three-hour laboratory period per week for eleven weeks. First quarter. Dr. Conant and Dr. Larsh.

MICROBIOLOGY SEMINAR. Graduate students and staff meet weekly to discuss and review recent microbiological literature. Throughout the year. All members of the Graduate Staff.

FUNDAMENTALS OF IMMUNOLOGY. A lecture course on general immunology including the following: Non-specific factors in immunity, nature of antigens and antibodies, antibody production, complement, serological methods, blood groups, autoimmune diseases, tumor, immunity, transplantation immunity, and hypersensitivity. Alternate years, first quarter. Dr. Amos, Dr. Day, Dr. Metzgar, and Dr. Zmijewski.

ADVANCED IMMUNOLOGY. Genetic control of antigen production, development of antigens in embryogenesis, destruction of antigens in tissue, relationship to differentiation, and aggregation. Theories of antibody formation. Nature of antibodies, combining site, antibodies of similar specificity but different properties, reactivity of antibody fractions. Mechanisms of tolerance and immunological paralysis, split and partial tolerance, immunological enhancement. Cellular immunity and the reactions of circulating and cytrophilic antibody. Homograft injections and autoimmunity and delayed hypersensitivity. Quarter to be determined. Dr. Amos, Dr. Day, Dr. Metzgar, and Dr. Zmijewski.

METHODS IN IMMUNOLOGY. This is essentially a laboratory course in which the student will learn the following methods of immunology:

agar precipitation, immunoelectrophoresis, direct agglutination, immunofluorescence, complement fixation and passive cutaneous anaphylaxis. Quarter to be determined. Dr. Metzgar and Dr. Zmijewski.

Immunochemistry. The structure of antibody molecules. The nature of the combining site. The hapten as a molecular probe. Forces involved in antigen-antibody interaction. Specificity, avidity and cross-reaction of antibodies. Purification of antibodies. Antibodies as analytical reagents. Prerequisites: Fundamentals of Immunology or Biochemistry or Physical Chemistry or consent of instructor. Quarter to be determined. Dr. Day.

Immunohematology. A lecture and laboratory demonstration course covering the serological, genetic and anthropological aspects of human blood groups, iso-antigens, and antibodies. Quarter to be determined. Dr. Zmijewski.

Antigenic Factors in Graft Rejection. Production of inbred and coisogenic strains. Mutation and recombination in inbred animals and tumors. Genetic control of histocompatibility iso-antigens in tumors and normal tissues, differential genc action in hybrids and tumors. Antigenic and immunologic factors in homograft rejection, tests for genetic compatibility. Modification of the immune response by genetic or immunologic procedures: tolerance, enhancement, suppression of antigens. Quarter to be determined. Dr. Amos.

Cancer Immunology. An intensive and critical analysis of progress in a major branch of immunological research covering cancer antigens, the tumor-homograft reaction, and the immunotherapy of cancer. Prerequisite: consent of thc instructor. Quarter to be determined. Dr. Day.

Seminar in Immunology. Selected topics on various aspects of immunology will be discussed. Seminars will be by students and faculty. Fourth quarter. Dr. Metzgar.

NEUROLOGIC SCIENCES PROGRAM

The Neurologic Sciences Program was established to integrate and enlarge the neurologic teaching and research activitics in the Medical Center. This Program is an interdisciplinary unit comprised of staff members of several pre-clinical and clinical departments whose interests are specifically related to the various neurologic disciplines. Its purpose is to provide greater learning experienccs for the undergraduate student and more comprehensive opportunities for training and research at the graduate level. Although each staff member has his individual teaching and research interests, all participate actively in joint conferences, ward rounds and seminars.

The fundamental orientation of the Neurologic Sciences Program is towards an understanding of the concepts and mechanisms of neurobiology and their particular application to the diseases of man. The brain and nervous system represent an extremely sophisticated and highly differentiated organ system with exquisite control mechanisms influencing general body metabolism and overall behavior. An integrated approach is offered in the study of these complexities and their dysfunctions. It is planned to give the undergraduate and graduate physician an understanding of the problems of clinical neurology as well as to introduce them to research experience which will serve as the foundation for future knowledge. The disciplines of neurochemistry, neurophysiology, neuropathology, and neuroanatomy, with their applications to molecular biology, electrophysiology, and electron microscopy, are available for such investigations.

Resident physicians from the Departments of Medicine, Neurosurgery and Psychiatry are given training in Neurology. Conversely, fellows and house officers in Neurology are assigned to various staff members for training in Neuropathology, Neuroanatomy, Electroencephalography, Pediatric Neurology and Neurosurgery. Faculty appointments may be held jointly in the Program of Neurologic Sciences and in other basic science or clinical departments. Teaching ward rounds for students, fellows, and resident physicians are conducted by senior staff members of the Neurologic Science Program five mornings a week at Duke Hospital and the affiliated Veterans Administration Hospital. Out-patient clinics are held twice weekly for follow-up care of patients discharged from the hospital and for treatment of new patients referred from other clinics or outside physicians. An extensive series of teaching conferences or seminars comprise an integral part of undergraduate and postgraduate training.

OBSTETRICS AND GYNECOLOGY

The first year student receives instruction in the fundamentals of obstetric and gynecologic history and pelvic examination during their course in Introduction to Clinical Medicine.

The second year student spends nine weeks in general obstetrics and gynecology. The student attends lectures, works daily in the general and special out patient clinics and is assigned patients on the obstetric and gynecologic wards. Student sharing in patient care and in teaching exercises is required. Tutorials are held daily with the senior faculty encouraging student participation. Lectures, Clinical Conferences, Gynecologic Pathology Conference, Endocrine Conference, and Correlative Seminars are a part of his learning experience and are outlined below.

Lectures. For the student who desires didactic, clinically pertinent, information only in order to gain insight into and understanding of the effects of pregnancy, or diseases of the reproductive system, as they relate to his major field of interest. 1 hour 4 times weekly for 9 weeks. Offered throughout the year. Dr. Parker and Staff.

Clinical Conference. Difficult problems in diagnosis and management are presented for consideration and discussion. Current patients, from the wards and the out-patient department, are selected. Course in general obstetrics and gynecology is a prerequisite. 2 hours twice weekly for 9 weeks. Offered throughout the year. Drs. Parker, Carter and Staff.

Gynecologic Cancer. A survey of malignant disease in the reproductive system. The didactic portion of the course is supplemented by presentations of patients currently in therapy on the wards and in the Gynecologic Cancer Clinic. 3 hours once a week. Offered throughout the year. Drs. Parker and Willbanks.

Pathology: Obstetrical and Gynecological. The primary emphasis is upon the gross and microscopic study of the removed tissues of the reproductive system, correlation of the findings with the clinical observations, and consideration of the implications as to the future well-being of the patient. General Pathology is a prerequisite. 1 hour once a week. Offered throughout the year. Dr. Willbanks and Staff.

Correlative Seminars. Exploration in depth of certain specific subjects both within the discipline and from some of the parameters. Discussions and presentations include disorders of other tissues and organ systems, and the influence upon and effects from pregnancy or gynecologic malfunction. 1 hour once a week. Offered throughout the year. Staff and invited faculty.

Preparation for Practice. For students preparing for: a) General Practice, b) Pediatrics, c) General Surgery, and d) Internal Medicine. In-Patient and Out-Patient duties as an intern in Obstetrics and Gynecology. Special lectures in obstetric management and office gynecology with emphasis on good practice techniques. Full time 18 weeks. Offered throughout the year. Limited to 5 students. Dr. Parker and Staff.

Research Training. For special students who desire fundamental training in research methodology in Obstetrics and Gynecology. Rotation will be provided through various laboratories. The student, by active participation in investigative projects, learns research techniques and methods as they apply particularly in Endocrinology, Cytogenetics, Cytology, Bacteriology, Chemotherapy, Maternal and Fetal Physiology,

Toxemia and others. Full time 18 weeks. Limited to 14 students. Offered throughout the year. Dr. Parker and Staff.

THE INFERTILE COUPLE. A didactic and clinical study of infertility in the human. Assigned reading of pertinent medical literature, both historical and current, is correlated with clinical observation in patients. The student is made familiar with testing techniques and the use of the required apparatus and instruments, and participates in the treatment of patients. 3 hours twice weekly for 9 weeks. Offered throughout the year except summer quarter. Limited to two students. Drs. Peete and Christakos.

HUMAN EMBRYOLOGY. For the student who desires a study of human growth and development in utero. In addition to assigned reading and lectures, pertinent gross and microscopic material shall be studied. Incorporates Developmental Anatomy, Physiology, Biochemistry and, as available, Developmental Pathology. 2 hours twice weekly for 9 weeks. Offered twice a year, Fall and Spring Quarters. Limited to 6 students. Dr. Cherny.

GENITAL CYTOLOGY. A comprehensive survey of clinical genital cytology. Special instruction is provided in preparation of material and interpretation of cytologic appearances. The general cytology library contains adequate resource material and current patient slides for study. 3 hours twice a week, for 9 weeks. Offered twice a year, Fall and Spring Quarters. Limited to 4 students. Dr. Cuyler and Miss Kaufmann.

GYNECOLOGIC BACTERIOLOGY. Work in the Clinical Laboratory of Gynecologic Bacteriology is carried out to provide a basic knowledge of special techniques in aerobic and especially in anaerobic culture. Correlation is made with clinical findings in patients with gynecologic infections. Participation in basic research is expected. 4 hours twice weekly for 9 or 18 weeks. Offered twice a year, Fall and Winter Quarters. Limited to 4 students. Dr. Carter and Mr. C. P. Jones.

RESEARCH PRECEPTORSHIPS. By individual arrangement with the faculty. Although research project assignments are the major undertaking, emphasis is maintained on the clinical implications and applications of the research.

CLINICAL PRECEPTORSHIPS. Primary emphasis on clinical applications of patient care. Teaching is done with current patients. Ambulatory treatment, ward rounds, operating room and delivery room experience is provided. By individual arrangement with faculty.

ENDOCRINOLOGY SEMINAR (Depts. Ob-Gyn, Medicine, and Pediatrics): Once-weekly sessions of one hour each with discussion of inter-

esting clinical problems and related clinical and basic research. Dr. Christian from Ob-Gyn Dept. plus other members of divisions of Endocrinology. Taught throughout the year.

Clinical Endocrinology. Elective course for student who desires additional clinical instruction in examination, diagnosis and treatment of obstetric and gynecologic patients with endocrinopathy. Course consists of examination and treatment of patients in the Endocrinology Out-Patient Clinic. 2 half days a week (4 hours each day). Taught throughout the year. Dr. Christian and Staff and Fellows of Endocrine Division.

Neuroendocrinology. Provides laboratory exposure in the current methods of neuroendocrine investigation, including stereotoxic stimuli and lesions, isotope localization, and immunochemistry of the ovulation-inducing hormones as well as rounds on those endocrine patients pertinent to the topic. One 9-week course. Full time. Any quarter by special arrangement. Dr. Christian.

Cytogenetics. For student who desires experience in depth of the genetic basis of disease. Course includes clinical studies as well as basic steps and procedures in cytogenetic research. 8 hours per week. Taught twice yearly, Summer and Winter Quarters. Limited to 4 students. Dr. Christakos.

Developmental Biology. This course will represent a joint endeavor by the Departments of Obstetrics and Pediatrics with the help of members from the Department of Anatomy, Biochemistry, Pathology, and Physiology. The student will explore problems of fertility and sterility, ovulation and implantation, placental transfer, fetal physiology and biochemical differentiation, and perinatal events and postnatal development. Examples for discussion will be drawn from the clinical material on the wards of Duke Hospital. Full time, nine weeks. Drs. Crenshaw and Harris.

Clinical Problems in Maternal-Fetal Interaction. An obstetric-pediatric study of factors concerning the mother and infant during pregnancy, labor, delivery, and the first month of life. Emphasis will be placed on teratogenic influences, abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely afflicting the fetus and newborn in the prenatal area, and hospital and early house management of the infant, especially as related to parent-child adjustments. When possible, a family will be followed during the pregnancy and throughout the first month of the infant's life. Available to five students. Full time, nine weeks. Drs. Crenshaw and Harris.

PATHOLOGY

The required course in pathology is given during the second term of the first year. The fundamentals of pathology are presented to the student by a correlated study of gross and microscopic material illustrating the structural changes in disease. Lectures developing broad concepts of disease processes are given by the members of the senior staff. Conferences with small groups of students under the guidance of a staff member are scheduled for purposes of more intimate discussion. The emphasis is placed on etiology and pathogenesis of disease and the experimental approach to an understanding of disease. Animal experiments performed either by students or by demonstrators are used to correlate functional and structural changes in disease. The group work is supplemented by weekly conferences involving the class as a whole and dealing with problems presented by current autopsies and with other problems of general importance. Student collaboration in post-mortem studies is required. Cases thus studied are presented by the student before the class under the direction of the staff; this takes the form of a clinical-pathologic conference in which each student plays a particular role.

THE PATHOLOGIC BASIS FOR CLINICAL MEDICINE. The study of disease will be approached by an examination of the pathologic processes as these affect the various systems and organs. An attempt will be made to orient the student in special pathology and to help him crystallize and apply the basic knowledge that he has acquired in the prerequisite pathology course. The course will be organized with lectures, laboratories, and experimental demonstrations. Clinical pathologic correlations, including correlation with radiologic findings, will be stressed. The case method of teaching will be emphasized and material from current and past autopsies utilized. The systems to be covered are the cardiovascular system, endocrine, respiratory, gastrointestinal, genito-urinary, female genital, hematopoietic, bones and joints, neuromuscular, organs of special sense, and skin. Prerequisite: Pathology. Four hours, three times a week. Quarter to be determined. Dr. Kaufman and Staff.

BASIC PROBLEMS IN CARDIOVASCULAR PATHOLOGY. This is an advanced course in diseases of the cardiovascular system with particular emphasis on the heart. A seminar-tutorial system will be used to explore physiological expressions of morphological abnormalities of the heart. Specific problems in heart disease and experimental approaches toward solution of the problems will be discussed and dealt with. Two hours, once weekly. Limited to six students. To be given once a year. Quarter to be determined. Dr. Wittels.

ADVANCED NEUROPATHOLOGY. Students will receive personal supervision in a detailed study of gross and microscopic neuro- and ophthal-

mologic pathology and in a review of neuroanatomy. They will assume limited responsibility for the performance of post-mortem examinations upon patients with neurologic diseases. Opportunities will be provided for an introduction into research methods, notably electron microscopy, as utilized in investigations of the nervous system. Limited to two students full time, twice a year. Quarter to be determined. Dr. Vogel, Dr. Klintworth and Staff.

Introduction to Immunopathology. This course is designed primarily for students planning to pursue postgraduate training in Pathology. The student is considered a full time research fellow and will perform selected experiments in which he will utilize techniques of immunochemistry, immunohistochemistry and morphology. In addition, the student will have the following scheduled appointments, twice a week: a) formal lecture; b) group discussion with staff; c) gross and microscopic morphology of selected human cases with immunopathologic conditions. The student will be given adequate time for library research and preparation of assigned topics for verbal and written presentations. Full time—once a year. Limited to four students. Quarter to be determined. Dr. Vazquez and Staff.

Exfoliative Cytology. This course will include study of available cells from various sources for diagnostic purposes. The identification of cell type, structure, and function will be done by applying various physical and chemical methods. Concomitant histological studies will be carried out. Particular emphasis will be given to diagnosis of malignant neoplasms. Experimental work and reviews of literature will be utilized as part of the study in this course. Four hours, three times weekly. To be given once a year. Limited to three students. Quarter to be determined. Dr. Klavins and Staff.

Obstetrical and Gynecological Pathology. This course is designed for the student who is oriented toward obstetrics and gynecology. Classroom work in the first seven weeks will include a coverage of all diseases involving the pregnant and non-pregnant female genital tract. The last two weeks of the course will be devoted to the practical application of the acquired knowledge through the study of current materials. Two days of study will be devoted to exfoliative cytology of the female genital tract. The student will be expected to participate actively in all phases of the course. Four hours, three times a week. Limited to five students. Quarter to be determined. Dr. Fetter.

Neoplastic Disease. Theoretical problems and concepts in neoplasia will be considered. The pathogenesis of certain types of tumor will be studied and consideration will be given to etiologic factors such as genetic, viral, physical and chemical. The influence of chemotherapeutic agents on neoplasia, both at the cellular and sub-cellular level,

will be studied. Seminars and lab periods. Four hours, twice a week. Quarter to be determined. Dr. Kinney and Dr. Klavins.

PULMONARY PATHOLOGY. This course is designed for students with an interest in pulmonary disease. The various diseases of the lung, neoplastic, infectious, and others, will be evaluated in relation to pathogenesis and etiology. Anatomic alteration will be correlated with functional incapacity and with the clinical findings. Four hours, once weekly. Quarter to be determined. Dr. Kinney and Staff.

PEDIATRIC PATHOLOGY. This course is designed to serve the interests and the needs of the students interested in pediatrics. A wide range of diseases associated primarily with pediatric patients will be studied. An attempt will be made to correlate pathological findings with the clinical picture. Four hours, once a week. Quarter to be determined. Staff.

HISTOCHEMISTRY AND CYTOCHEMISTRY. A wide range of histochemical and cytochemical observations in cells will be correlated with basic biochemical intracellular processes and the localization of these processes. The qualitative and quantitative alterations in the cells seen in disease states will be studied. The methods utilized in this course will be taught to students who will be expected to carry out the observations on materials which they have prepared themselves. Four hours, once a week. Limited to three students. Quarter to be determined. Staff.

ELECTRON MICROSCOPY IN PATHOLOGY. This course is presented for those students who wish to broaden their basic knowledge of cellular structure and cellular pathology. Formal instruction will be designed to: 1) explain basic electron microscopic technique: its advantages and its limitations; 2) to interpret the rapidly accumulating body of electron microscopic studies in the literature; and 3) to review the areas where electron microscopy has made significant contributions to our understanding of pathology. The resources of the laboratory will be available to demonstrate the techniques of specimen preparation and the operation of the electron microscope. The students will have the opportunity to prepare and examine clinical or experimental pathologic material already on hand and to apply the information obtained through formal instruction. Seminars will be held to involve the students with their subject in depth. Two hours, twice a week. Limited to two students. Quarter to be determined. Staff.

PATHOLOGY OF THE GASTROINTESTINAL SYSTEM. This course will explore the diseases of the gastrointestinal system, including diseases of the liver and pancreas, in greater depth and breadth than available in other courses. A wide range of diseases of this system will be reviewed, and pathologic changes will be correlated with clinical findings and

physiological and biochemical processes. Collected material available in the department and current material from the autopsy service will be utilized. Material from surgical pathology will be used as it becomes available and the findings will be correlated with the clinical symptoms manifested by the patients on the ward. Diseases covered will be congenital, nutritional, neoplastic, infectious, and metabolic. Seminar and group teachings will be combined with laboratory periods. Two hours weekly. Limited to four students. Quarter to be determined. Dr. Klavins and Staff.

Cellular Pathology. The subject and the objectives of this course will be introduced by a historical review followed by detailed demonstration, discussion, and, in the laboratory period, selected application of methods of investigation in cellular pathology. Subsequently, the structural equivalent in individual cells of the injured function of total organs will be discussed. The final portions of the course will be devoted to the specific cellular pathology of viral, neoplastic, and other selected diseases as well as to diagnostic cytology. Two hours, twice a week. Limited to six students. Quarter to be determined. Dr. Sommer.

Autopsy Pathology. The students will work directly with one of the members of the Pathology Staff. They will first assist at autopsies and then perform a few selected autopsies. The emphasis will be on a very careful study of a small number of cases, selected to exemplify important pathologic processes. The examination of cases will include correlated reference to other cases on file in the department and to appropriate current and old literature. Full time. Offered all year around. Limited to four students. Staff.

Cardiovascular Pathology. This course will stress clinical correlation with pathologic problems in the cardiovascular system. The normal anatomy and embryology of the cardiovascular systems will be reviewed, including a consideration of the normal and abnormal conducting system and electrocardiogram. The various disease processes will be studied in detail, utilizing gross and microscopic specimens, examination of patients with similar diseases, and consideration of laboratory diagnostic techniques. Three hours, once a week. Limited to twelve students. Quarter to be determined. Dr. Hackel and Staff.

Problems of Abnormal Growth and Development. A survey of experimental studies of genetic, chemical, and physical factors related to disorders of development and growth with review of normal embryonic and fetal development; induction and organizers; cellular differentiation and interaction; development arrest, mechanism of action and specificity of teratogenic agents. Two hours per week as seminar group. Each student to meet instructor individually for one hour tuto-

rial per week. Limited to five students. Quarters to be determined. Dr. Elchlepp.

METHODS OF STUDY OF ABNORMAL GROWTH AND DEVELOPMENT. Laboratory techniques in experimental embryology and teratology, including demonstrations of dependent differentiation, induction of malformations, production of chromosomal abnormalities, and karyotyping. Limited to five students. To meet as one three-hour laboratory period per week for nine weeks. Three hours per week. Quarters to be determined. Prerequisite: Concurrent enrollment in Problems in Abnormal Growth and Development. Dr. Elchlepp.

RESEARCH IN PATHOLOGY. Independent research projects in the various fields of pathology. Time and credit to be arranged. Dr. Kinney and Staff.

LABORATORY MEDICINE. This course will give the student understanding of the theoretical and practical bases of various laboratory procedures. Methodology and sources of error will be considered, and correlations made between laboratory findings and physiologic and biochemical alterations in disease processes and in various disease states. The shortcomings and the benefits derived from the rational and critical utilization of laboratory procedures will be emphasized. This course will act as a bridge between the basic science and clinical science disciplines. The student will learn to evaluate present tests and procedures and their modifications and will learn to evaluate critically new procedures as they evolve and develop. The knowledge obtained previously in biochemistry, pathology, hematology, and microbiology will be drawn upon heavily in this course. The teaching techniques utilized will be seminars, tutorials, laboratory periods, and visits to the wards. Limited to four students. Four hours, twice a week. Quarter to be determined. Dr. Musser and Staff.

PATHOLOGY OF THE BONES, JOINTS, AND RELATED STRUCTURES. The various diseases of the bones and joints will be reviewed and studied. The course will be structured around seminars and laboratory periods when gross and microscopic material will be studied. Emphasis will be placed on the natural history of the lesion, pathogenesis, and correlation with roentgenographic, clinical, and laboratory findings. Two hours, once a week. Quarter to be determined. Staff.

PATHOLOGY OF URINARY AND MALE GENITAL SYSTEMS. The main purpose of this course will be the detailed study of diseases of the urinary and male genital systems, correlating basic science, pathologic, and clinical aspects. The normal anatomy, embryology, and physiology of the kidney will be reviewed, and various congenital, inflammatory, neoplastic, toxic, and hypersensitivity renal diseases will be studied.

Gross and microscopic specimens will be available and will be correlated with practical patient problems. A similar approach will be followed for the male genital system. A few selected animal demonstrations of pathologic processes will be performed, permitting some experience with immunopathologic and electron microscopic problems. Three hours, once a week. Limited to twelve students. Quarter to be determined. Dr. Hackel and Staff.

Surgical Pathology. This course is designed for the student who wishes more experience in the study of disease. Although the course is entitled Surgical Pathology, this does not imply interest solely in the individual oriented to surgery. Examination of all tissues removed will be performed so that problems in dermatology, gynecology, orthopedics, general surgery, internal medicine, etc., will be considered. The primary emphasis will be upon study of the removed tissues and correlation of these findings with the clinical observations. Each day's work will consist of three parts: 1) study of gross material; 2) study of microscopic sections; and 3) ward rounds. Four hours—five times a week for one quarter. To be given twice a year, quarters to be determined. Limited to five students. Dr. Fetter and Dr. Smith.

PEDIATRICS

The basic course in pediatrics consists of seven weeks during the second year, the time being equally divided between clinic and ward services. Students participate in the morning subspecialty clinics, the well baby clinics, and afternoon general medical pediatric clinics, seeing both new and return patients. Each week, a one-hour conference is held at the end of the following specialty clinics: hematology, metabolism, neurology, cardio-renal, allergy, convulsive disorders, behavior problems, endocrinology, and well baby care. Each afternoon, there is a one-hour conference in the general pediatric clinic with informal presentation and discussion of patients. On the wards, the students assist as clinical clerks and are assigned patients in rotation. They make daily rounds with the staff. Pediatric nursing procedures are demonstrated by the nursing supervisor. The different subspecialty groups—cardiology, hematology, allergy, endocrinology, dermatology, metabolism—make ward rounds weekly. A joint conference with the senior and resident staff is held twice weekly on topics of pediatric interest, clinicopathologic discussions, case presentation, and for guest lecturers. There is a weekly radiology conference at which the interesting cases of the week are presented and discussed with the radiologist. Each student prepares a paper on a pediatric subject of his own choosing which they present to the entire group in an informal discussion.

General Pediatrics. The student will be assigned to the wards, clinics, and newborn nursery according to his interest and goals. In

general, he will have an apprenticeship in pediatrics with learning experiences stemming directly from the patient and his problems. Ten students. Full time, 9 weeks. Given every quarter. Dr. Harris and Staff.

PEDIATRIC NEUROLOGY AND CONVULSIVE DISORDERS. The student will examine and discuss patients with neurological and convulsive disorders in the wards and clinics of Duke Hospital and in the in-patient facilities of the Murdoch Center. In Dr. Renuart's laboratory at the Murdoch Center, he will learn the techniques and significance of various screening tests for metabolic disturbance causes of mental retardation and convulsive disorders. Limited to two students. Full time, first and third quarters. Dr. Renuart and Staff.

MENTAL RETARDATION. Survey of medical, psychological, social, and special educational aspects of mental retardation, including clinic evaluation and management approaches. Utilization of existing neurologic, endocrinologic, and child guidance clinic facilities, and field work at the Murdoch Center. Limited to three students. Full time, second and fourth quarters. Dr. Renuart, Dr. Engstrom, and Staff.

PEDIATRIC CARDIOVASCULAR DISEASE. An interdisciplinary type of elective will be available in Cardiovascular Disease involving the Departments of Medicine, Surgery and Pediatrics. Two thirds of the elective will be spent in clinical areas with close patient contact. An integrated approach will allow the student to work-up the patient on admission, participate in special diagnostic studies (e.g., cardiac catheterization), follow the patient to the operating room, and then participate in post-operative care. Students may elect, within the program, to spend the major portion of their time in the areas of surgical cardiology, adult medical cardiology, or pediatric cardiology. Several weekly conferences will be attended by all students on the elective in Cardiovascular Disease. One third of the elective time may be spent in special areas, such as electrocardiography, experimental surgery, or research. Since each student in the Cardiovascular elective will be primarily responsible to a senior staff person in one of the three areas (cardiac surgery, adult medicine, or pediatric cardiology), it is anticipated that an active interchange of ideas will prove to be a strong catalyst for the student to view cardiovascular disease as it occurs in all age groups, to obtain a concept of methodology and diagnosis, and to envision an approach to medical and surgical therapy. Each student will be primarily under the supervision of one Division (e.g., Medical Cardiology, Cardiac Surgery or Pediatric Cardiology). Limited to five students. Full time, all quarters. Dr. Spach and Staff.

PEDIATRIC ENDOCRINOLOGY. The elective program in pediatric endocrinology will allow the student broad exposure to clinical endocrine

material through active participation in the operation of the Pediatric Endocrine Clinic and certain non-pediatric endocrine clinics within the Endocrine Division. Students will become acquainted with the techniques of metabolic studies performed on the Clinical Research Unit when patients with hormonal disturbances are available for investigation. During the elective period, particular stress will be placed upon the application of methods of hormone assay and steroid measurement to the diagnosis of endocrine disorders in childhood. A series of biweekly endocrine seminars (one clinical and one basic) will be conducted for students, assigned house staff, and fellows. In addition, participants will attend the regular conferences, seminars and ward rounds of the Endocrine Division. Limited to four students. Full time, second and third quarters. Dr. Stempfel and Staff.

Allergy and Pulmonary Diseases. An intensive course in the clinical evaluation, diagnosis, and treatment for all types of allergic problems in children such as eczema, asthma, allergic rhinitis, urticaria, food, drug, bacterial allergies, collagen, autoimmune diseases and immunological abnormalities. The clinical work is amplified by laboratory experiences, skin testing procedures, pollen identification, preparations of allergens, allergy vaccine, and appropriate immunologic tests. Students will see numerous patients with chronic lung disease, especially cystic fibrosis of the pancreas, and will utilize pulmonary function tests and blood gas analyses as they apply to the respective patients. The students will have an opportunity to see how other medical specialties such as Dermatology, ENT, Psychiatry, Endocrinology, Physiology, Physical Therapy, and Inhalation Therapy relate to the various allergic problems. Limited to six students. Full time, all quarters. Dr. Susan Dees and Dr. Spock.

Developmental Biology. This course will represent a joint endeavor by the Departments of Obstetrics and Pediatrics with the help of members form the Departments of Anatomy, Biochemistry, Pathology, and Physiology. The student will explore the problems of fertility and sterility, ovulation and implantation, placental transfer, fetal physiology and biochemical differentiation, perinatal events and early postnatal development. Examples for discussion will be drawn from the clinical material on the wards of Duke Hospital. Limited to three students. Full time, second and fourth quarters. Dr. Harris and Dr. Christian.

Metabolic Disorders. The course will be open to students, preferably those who have or wish to start a laboratory project. The project may be in any laboratory but must have a bearing on normal or abnormal metabolism. There will be assigned reading, weekly seminars, weekly rounds in conjunction with interdepartmental groups interested

in metabolic disorders, and duties in relation to in-patients and out-patients with metabolic disorders. Full time, each quarter. Limited to two students. Dr. Sidbury.

PEDIATRIC HEMATOLOGY. The course will include all aspects of clinical and laboratory pediatric hematology with emphasis on fundamental concepts as related to hematologic disorders. There will be daily ward rounds, a weekly clinic, weekly slide conferences, weekly seminars, as well as assigned reading. Students will be encouraged to engage in some individual clinical or laboratory project during the period of the course. Limited to two students. Full time, all quarters. Dr. Porter.

CLINICAL PROBLEMS IN MATERNAL-FETAL INTERACTION. An Obstetric-Pediatric study of factors concerning the mother and infant during pregnancy, labor, delivery, and the first month of life. Emphasis will be placed on teratogenic influences, abnormal conditions of pregnancy as related to the infant, prenatal pathological conditions adversely afflicting the fetus and newborn, and early management of the infant, especially as related to parent-child adjustments. When possible, a family will be followed during the pregnancy and through the first month of the infant's life. Limited to five students. Full time, first and third quarters. Dr. Christakos and Dr. McBryde.

POISON CONTROL CENTER. The student will participate in all functions of the Center. He will be on-call for the treatment of these cases in the Emergency Room or ward and will help compile the monthly data, discussing each report with the Director. Seminars will be arranged with the Director and appropriate members of the University faculty (pharmacology, pathology, biochemistry). Limited to three students. Full time, first quarter. Dr. Arena.

PRECEPTORSHIP IN GENERAL PEDIATRICS. The student will spend several days each week with selected practicing pediatricians or a group of associated pediatricians in Durham. He will participate in daily newborn-premature rounds at Duke and Watts Hospital, conduct well-baby conferences in the town of Durham and at Duke, and attend prenatal conferences and clinics with emphasis on observation of abnormal pregnancy. The aim of this course is to give the student insight into the management of well and ill children in an atmosphere which will prevail when he enters practice. Limited to three students. Full time, all quarters except summer. Dr. Arena, Dr. McBryde and Staff.

NEWBORN AND PREMATURE INFANTS. Students will have intensive experience in the newborn and premature nurseries. Included will be discussions of prenatal hazards, resuscitation, care of the normal newborn and premature infant, and pathological and normal psychological

conditions occurring in the newborn and their treatment. Emphasis is placed on the initiation of parent-child relationships, and of breast feeding. Limited to nine students. Full time, all quarters except summer. Dr. McBryde.

Behavioral Aspects of Pediatric Illness. The students experience with children will include the impact on the family as well as the psychic and somatic adjustment of the child. Limited to six students. Second, third and fourth quarters. Dr. Jones, Dr. Stedman and Staff.

Research Preceptorship in Child Development. Introductory experience in research and methods of investigation pertaining to behavioral and biological factors in infants and children. May include parent-child relationships, learning, motivation, personality, perception, cognition, psychophysiologic processes, and statistical techniques in common use. This course is also listed as Human Behavior 313. Limited to ten students. Four hours per day, two quarters. Time to be determined. Dr. Harris and Staff.

PHYSIOLOGY AND PHARMACOLOGY

The required course in physiology consists of lectures, seminars and laboratory exercises offered by all members of the physiology staff during the fall term of the first year. The core course in pharmacology consists of lectures, seminars and laboratories offered by all members of the pharmacology staff during the spring term of the first year. These courses emphasize those facts and general principles of physiology and pharmacology which all medical students should learn no matter which of the many careers in medicine and the medical sciences they may choose to pursue.

Tutorial in Physiology and Pharmacology. Required for all third and fourth year medical students who elect to concentrate in physiology or pharmacology. Guided independent study of original literature leading to preparation of thesis. Laboratory work optionally assigned by tutor. Spring and fall terms. 4 quarters, 4 or more hours per week. All members of staff, every year.

Foundations of Contemporary Physiology. Seminar course in mathematics, physics and chemistry of special relevance to contemporary physiology. Physical and chemical principles are taught with examples from physiology. Spring term, 2 quarters, 4 hours per week. All members of the physiology staff, every year.

Clinical Physiology. A seminar course in human physiology emphasizing the physiological basis of clinical medicine. Physiological principles are illustrated by examples from clinical cases. Fall term, 2 quarters. Drs. Boyarsky, Gorten, Stempfel and staff, every year.

PHYSIOLOGICAL INSTRUMENTATION. Deals with modern electronic methods of measurement of physiological variables. The necessity of understanding the physiological system in order to avoid possible interaction between it and the measuring system is emphasized. The concepts and use of feedback to make linear instruments and to perform numerous operations are used throughout the course. Specific topics covered include: passive elements and networks, potentiometric and currentometric recorders and amplifiers, data processing, measurement of biological potentials, currents, pressure and flow. Fall term, 2 quarters, 2 hours per week. Dr. Moore and members of the Dept. of Electrical Engineering, every year.

CELLULAR ENDOCRINOLOGY. Current concepts of the mechanism of action of hormones are covered with special reference to the effects of hormones on cell membrane permeability and on the activity of enzyme systems. The relationships of these cellular actions of hormones to the hormonal regulation of growth, metamorphosis, osmoregulation, pigmentation and reproduction are discussed. Spring term, 2 quarters, 2 hours per week. Dr. J. L. Kostyo, 1966 and every other year.

TOPICS IN MUSCLE PHYSIOLOGY. This course will cover the following topics: Cellular basis of activity in skeletal, cardiac and smooth muscle; ionic properties of muscle membranes; submicroscopic structure of muscle and the molecular basis of contraction; the problem of electro-mechanical coupling; the mechanics and thermodynamics of muscular contraction; design and control problems for the production of movement in various animals. Fall term. 2 quarters, 2 hours per week. Dr. Horowicz, 1966 and every other year.

CELLULAR TRANSPORT PROCESSES. A sequential study of the following topics: the physical chemistry of transport processes which occur in living cells (e.g., diffusion, flow, electric current), contemporary knowledge of the molecular mechanism of salt and water transport across cell membranes with special reference to the conversion of chemical bond energy to transport work in active transport, the integration of transport processes in individual plasma membranes to accomplish regulation of cytoplasmic salt and water composition and cell volume, and the secretion of fluids across epithelial cell layers in organs specialized for this function (intestine, kidney). Spring term. 2 quarters, 2 hours per week. Dr. Tosteson, 1967 and every other year.

RESPIRATION AND AERO-PHYSIOLOGY. A study of the fundamental respiratory processes in living organisms and of the special physiological responses and adjustments of individual during high-altitude flight. Lectures, conferences and laboratory. Spring term, 2 quarters, 2 hours per week, Drs. Hall and Salzano.

Physiology and Pharmacology of the Central Nervous System. A seminar course in the integrative functions of the central nervous system from simple reflexes involving the spinal cord to complex activities subserved by various regions of the brain. Spring term, 2 quarters, 2 hours per week. Dr. Somjen, B. Renkin and staff, 1967 and ever other year.

Physiology of Hearing. General principles of operation of sensory organs are illustrated by examples taken from the ear. Organization and integration of auditory input in the end organ, the brain stem nuclei, and the central cortex are emphasized. Auditory perception is also discussed and related to neural mechanisms. Spring term, 2 quarters, 2 hours per week. Dr. Greenwood and staff, 1966 and every other year.

Cellular Metabolism and Energetics. The metabolic activity of cells will be considered from the point of view of the flow of energy through the cell. Special attention will be given to the mechanisms coupling the energy providing systems to the energy utilizing systems. Spring term, 2 quarters, 2 hours per week. Dr. Jobsis, 1966 and every other year.

Cellular Neurophysiology. Deals with current concepts as to the structure and electrical impulse propagation in nerves. The powerful new experimental techniques used in the study of isolated membranes and the resulting theoretical models are covered. Adaptation of these models assists in the description of receptor and synaptic properties. The effect of cellular geometry on its function is considered. Spring term, 2 quarters, 2 hours per week. Dr. Moore, 1967 and every other year.

Physiology of Cell Growth and Cell Development. Topics to be covered in this course will include: population kinetics; thermodynamics of growth; the timing of events of the cell cycle; molecular aspects of mitosis and of the duplication of cell organelles. Spring term, 2 quarters, 2 hours per week. Dr. Blum, 1967 and every other year.

Foundations of Contemporary Pharmacology. Chemical and physical principles underlying drug action are discussed. The role of various molecular properties in determining the biological effects of compounds is emphasized. Fall term, 2 quarters, 4 hours per week. Dr. E. Renkin and staff. Every year.

Circulatory Physiology and Pharmacology. A seminar course in the mode of distribution of drugs in the body. Special emphasis is given to the roles of blood flow and permeability factors in determining the rate and pattern of distribution. Fall term, 2 quarters, 2 hours per week. Dr. E. Renkin, 1967 and every other year.

CARDIAC PHYSIOLOGY AND PHARMACOLOGY. A study of cellular activity in the heart and how it is modified by drugs. Consideration is given to excitation, conduction, and contraction of cardiac muscle fibers in the presence and absence of pharmacologically active compounds. Fall term, 2 quarters, 2 hours per week. Dr. Johnson, 1966 and every other year.

CELLULAR ASPECTS OF DRUG ACTION. An introduction to cell-drug interaction emphasizing mechanisms of action and structure-activity relationships of chemical agents. Prerequisites: organic chemistry, introductory animal or plant physiology. Undergraduates by permission of instructors. Fall term, 2 quarters, 2 hours per week. Drs. Bernheim, DeTurk and Ottolenghi, 1966 and every other year.

PHYSIOLOGY AND PHARMACOLOGY SEMINARS. A weekly meeting in which original researches by members of the staff and guests are reported. Required of all graduate students who are candidates for the M.A. or Ph.D. degree. All members of the Graduate Staff.

PREVENTIVE MEDICINE

The required course in preventive medicine will be given during the first year. Forty lecture hours are given by faculty and guests. This series serves as an introduction to biostatistics, epidemiology, industrial medicine, community health and family physician, transmission and natural history of some diseases.

PROSPECTIVE MEDICINE—THE HUMAN RESPONSE TO ENVIRONMENTAL AGENTS. The range and variation of human response to overt and subtle environmental agents will be studied prospectively. The normal adaptative and immunologic mechanisms through which the human acts and reacts to maintain health will be discussed in chronologic sequence from conception through senility. Fundamental and applied information from medical, clinical, and social sciences will be included. Conditions or diseases with (1) known etiologic agents, such as viral, bacterial, fungal or parasitic, and (2) unknown etiology, such as hypertension and peptic ulcer, will be discussed. No limit to number of students. Three consecutive hours once each week. Second quarter. Dr. DeMaria and Staff.

INTERNATIONAL HEALTH ORGANIZATIONS. A seminar surveying the history, organization and accomplishments of the World Health Organization and its regional offices, health programs of the U. S. Agency for International Development, the Alliance for Progress, the Rockefeller, Kellogg and other private foundations. Smaller private organizations (HOPE, MEDICO, etc.) and their contributions will be considered. Prerequisite for "International Medicine." Three lectures weekly for

one quarter to be given once per year. 5-10 students. Second quarter. Dr. Long and Staff.

International Medicine. This course will include a survey of the inter-relationship of health with political, economic and educational programs, with emphasis on the problems of developing countries. Health problems of Latin America and Middle Africa will be given detailed consideration. The course will include a written paper by each participating student. Course on International Health Organizations is a prerequisite. Three lectures weekly for one quarter. Quarter to be determined. Dr. Long and Staff.

Research Preceptorship in International Health. The student will make a detailed study of a major health problem in the Western Hemisphere, using library and other resources. Spanish language instruction will be included through the Summer School program. The preceptorship will include a visit to a Latin American country for which financial assistance will be available. Courses on "International Medicine" are prerequisites. Summer quarter. Four days weekly. Dr. Long.

Research Preceptorship in Studies of Renal Function and the Vasculature. The student can enter into current projects or conduct independent study under senior staff guidance. The studies range from enzyme analysis of specific tissues under autonomic and pharmacologic influence to human conditioning experiments involving the cardio-renovascular systems. Full time for at least three consecutive quarters. One or two students by special arrangement. Dr. DeMaria.

Adolescent Medicine. These series will review primarily the sequence of biologic events occurring during this transitional phase of human development. Relationship of these factors to the diseases and psycho-social problems encountered will also be discussed. One hour per week during third and fourth quarters. No limit on number of students. Drs. DeMaria, Persons, Portwood, Naumann and guests.

Student Health. One half time (afternoon) for one or two quarters by special arrangement. Dr. Persons and Staff.

Note: The department will offer an elective three-phase program utilizing summer and/or elective periods. This is a formal and applied program in community health at a national and international level and is under the combined direction of the University of North Carolina School of Public Health, University of North Carolina Department of Preventive Medicine and the Duke Preventive Medicine Department. Dr. DeMaria and Dr. Long by special arrangement.

PSYCHIATRY

HUMAN BEHAVIOR AND PSYCHIATRY

In addition to required and elective courses in clinical psychiatry this department offers, through its Division of Human Behavior, course work in the biological and behavioral sciences which form the bases of psychiatry and the psychological aspects of medicine.

During the first year, 60 hours are devoted to human behavior. A lecture series introduces the student to the concepts, techniques, and data of the various sciences most relevant to an understanding of human behavior, thus providing a multifaceted approach to that understanding. Lectures from the fields of behavioral neurobiology, psychology, psychiatry, internal medicine and sociology discuss behavior from the points of view of heredity and constitution; the central and autonomic nervous systems; inner emotional conflicts and interpersonal relationships; learning, cognition and perception; relationships between the individual and his family, the social institutions, and his sub-culture and culture. Both functional and developmental points of view are presented and, in connection with the latter, stages in the development of the individual personality are traced. Wherever possible, relationships between the various approaches to human behavior are stressed. Concurrent with the lectures, a series of small group meetings provide, through the interviewing of patients and group discussion, opportunity for the further assimilation of the lecture material and its application to specific examples of behavior. The small groups also provide opportunities to introduce effective techniques of human interaction and observation of the primary data of human behavior as well as methods of recording and interpreting these observations. In both the didactic and small group "laboratory" portions of the course, emphasis is placed upon the complementarity of the biological and psychosocial approaches to human behavior and the relevance of such a combined approach for the practice of medicine.

The required second-year course in clinical psychiatry is for seven weeks. The student assumes limited responsibility, under supervision, for diagnosis and treatment of patients on the psychiatric wards, in the psychiatric out-patient clinic, and (through the psychosomatic consultation services) on the non-psychiatric wards of the hospitals. Supervision is directed toward two principle areas. The first is the significant application of concepts of diagnosis, psychopathological formulation, and therapy. Concepts in these areas are drawn from both the descriptive-organic-directive and the psychoanalytic-psychosocial-psychotherapeutic contributions to current psychiatric thought. Secondly, supervision is aimed at further developing interpersonal techniques of sensitive observation and therapeutic use of the self. Emphasis is placed upon concepts and techniques applicable to all patients as well as those

specifically designated "psychiatric." Didactic instruction includes seminars on the principle neurotic conditions (symptomatic, characterological and psychophysiological), the major psychoses, emotional problems of childhood, the somatic therapies, psychological testing, and introductory electroencephalography. In addition to rounds and case conferences students are encouraged to observe psychotherapy and participate in supervised psychotherapeutic encounters whenever appropriate situations can be provided.

Human Behavior

Philosophy of Science and the Behavioral Sciences. A survey of current theories of knowledge, particularly as they relate to the special complex problems of empirical meaning, objectivity, measurement, and verification in studies of human behavior. Consideration is also given to the mind-body problem. Twice weekly for 1½ hours for one quarter. To be offered twice during the year, first and fourth quarters. Dr. Hine.

Introduction to Behavioral Research. An intensive introduction to the logic and principles of experimental design and data processing in psychological research. Emphasis will be upon techniques of experimentation with molar behavioral variables and upon critical analysis of published research in psychiatrically relevant areas. Philosophy of Science and the Behavioral Sciences is a prerequisite. One hour, three times weekly for one quarter. To be offered twice a year, second and fourth quarters. Dr. Carson and Staff.

Introduction to Statistical Analysis and Inference. An introduction to probability theory and the use of descriptive and inferential statistics in scientific research. Topics will include measurement distributions, sampling, scaling, the concept of variance, correlation, and analysis of experimental data. The student will be introduced to the use of parametric and non-parametric techniques suitable for use with behavioral and biometric variables. One hour, three times weekly for one quarter. To be given twice a year, third and summer quarters. Dr. Carson and Staff.

The Biological Evolvement and Neural Basis of Behavior. A seminar surveying the biological bases of human behavior through discussions of imprinting; early mammalian affective development; classical and instrumental conditioning with particular emphasis on the autonomic nervous system; the psychological literature on RNA research; electrophysiologic correlates of higher mental processes including learning, memory and perception; the relevant human and animal literature on EEG; evoked potentials and microelectrode recording. Theoretical formulations based on communication theory will be pre-

sented. Three times weekly for 1½ hours for two quarters. To be given once per year, time of year to be determined. Drs. Shmavonian, Obrist, Spradlen and Staff.

HUMAN BEHAVIOR AND CEREBRAL DYSFUNCTION. This course will include a brief historical review of significant figures and trends of thought in the area of brain function covering the associationistic schools of thought, subsequent development of the reactionary field theories, and recent trends toward the revival of localization of function. Pathological conditions of the brain will be reviewed with emphasis upon how such conditions might differentially affect the structure and function of the nervous system. A presentation of the behavioral correlates of brain damage will be included. Focus will be on an examination of evidence for and against the regional localization of psychological abilities. The course includes five hours of assessment activity with brain-damaged patients. One hour, twice weekly for one quarter. Time of year to be determined. Dr. Thompson.

GROUP DYNAMICS AND GROUP SENSITIVITY TRAINING. A series of seminars dealing with the data and theory of small group processes, plus a two-week sensitivity training experience whereby individuals learn about effects of interpersonal interactions and group processes through direct experience. Behaviors and feelings are discussed as these contribute to the development of a specific group culture. In encouraging self-awareness, the technique becomes an educational device which offers potential for generalizing to other interpersonal situations. Permission of the instructor is required for participation in this course. One hour, once weekly for one quarter plus daily 1½ hour meetings during a two week segment of the quarter. Time of year and number of times offered to be determined. Dr. Lakin.

PERSONALITY DEVELOPMENT OF THE CHILD, ADOLESCENT, AND ADULT. A survey of personality development from pregnancy through old age, combining biological and psychodynamic approaches. Included are didactic presentations, discussions of assigned literature, and direct observations of, and interaction with, normal children and adults of various ages and in several settings. Two hours, three times weekly for one quarter. To be offered three times per year, quarters to be determined. Dr. H. J. Harris and Staff.

COMPARATIVE PERSONALITY THEORY. An examination of representative models of human functioning from Freud to the present. Topics will include examples from psychoanalytic, interpersonal, field theoretical, and behavioristic approaches. One hour, three times weekly for one quarter. Quarters to be determined. Dr. E. Crovitz.

PRINCIPLES OF PSYCHOLOGICAL ASSESSMENT. A theoretical and technical introduction to the measurement of individual differences by

means of psychometric and projective approaches. The student is introduced to the theory of test development and application through an examination of such concepts as standardization, reliability, and validity. Exemplary assessment instruments are subjected to detailed analysis. One hour, three times weekly for one quarter. To be given twice yearly, first and third quarters. Dr. Huse.

Social and Cultural Aspects of Illness. A seminar on medically relevant social roles in an institutional context, the doctor-patient relationship, and the hospital as a social organization. Two hours, once weekly for two quarters. To be given once each year, time of year to be determined. Dr. Maddox or Dr. Preiss.

Experimental and Clinical Psychopathology and Psychophysiology Seminar. The aim of this seminar is to examine clinically defined categories of psychopathology and experimentally produced analogues of clinical symptoms. Neurophysiologic, biochemical, sociocultural, psychodynamic, conditioned reflex, and developmental clinical and laboratory studies related to psychopathological symptom formation are reviewed and related to case material whenever possible. The emphasis is on developing testable explanatory concepts of clinical psychosomatic and psychopathologic symptoms, and on the integration of experimental research and clinical observations. Two hours, once weekly for two quarters. Course given once each year, first quarter. Dr. Cohen.

Research Preceptorship in Biological Psychiatry. This course will be comprised of selected experiments and instruction in experimental and clinical neurophysiology, physiology, and neurochemistry. The course content can be altered to include other subjects such as neuroendocrinology or neuropharmacology. Full time for two or three quarters; up to one half time may be used for didactic work in related courses. To be offered throughout the year. Dr. Wilson.

Research Preceptorship in Child Development. Introductory experience in research and methods of investigation pertaining to behavioral and biological factors in infants and children. May include parent-child relationships, learning, motivation, personality, perception, cognition, psychophysiologic processes, and statistical techniques in common use. (This course is also listed by the Department of Pediatrics.) Half time daily for one quarter. Offered throughout the year. Dr. H. J. Harris.

Research Preceptorship in Social Psychology. Experience in the design and execution of medically relevant research involving small human groups in an experimental setting. Four hours per week for one quarter. To be offered alternate quarters throughout the year. Dr. Back.

RESEARCH PRECEPTORSHIP IN PSYCHOPHARMACOLOGY. The student participates in a study of psychotropic drug action on patients and normal subjects, utilizing physiological and psychological measures. Five hours daily, four days weekly for one quarter. To be given throughout the year except summer quarter. Dr. Reckless.

RESEARCH PRECEPTORSHIP IN PSYCHOPHYSIOLOGY. Students either will conduct an independent supervised investigation, or will work on investigations already underway, and will complete a critical review of experimental and clinical literature relevant to the research in which they participate. The students will attend weekly conferences of the Division of Psychophysiologic Research in which current research of trainees is reviewed; Psychophysiology Student Training Seminars devoted to research design and statistical analysis of psychophysiologic data, biolectric measurement techniques, experimental methods in psychophysiology; and the seminar of the Mental Health Research Training Program in Biologic Science. The senior seminar will be presented by the training staff of the Mental Health Basic Biologic Research training program to acquaint trainees and students with current research of the various disciplines in the program such as neuroanatomy, neurophysiology, muscle physiology, biochemistry, endocrinology, psychophysiology, and bioradiophysics. The seminar will include critical reviews of areas such as nucleic acid and memory mechanisms, physiology of emotional states, neural basis of conditioning, behavior and emotions, neurophysiology of motivation, neurochemistry of c. n. s. energy transfer, neuropharmacology, chromosomal aberrations, and phychosexual development. The major aim of the training period is not to develop technically skilled researchers but rather to broaden the students' understanding of human behavior and psychophysiology and the experimental approaches to these areas which may have application to clinical diagnosis and treatment. Human Behavior and Psychiatry are prerequisites or must be taken concurrently with this preceptorship. Full time for a mimimum of three quarters. Offered throughout the year by special arrangement with instructor. Drs. Cohen, Shmavonian and P. Hein.

PROCESSES OF AGING. Basic information on theoretical and experimental work in the field of Aging will be presented by the investigators in many disciplines. Biochemistry, medicine, surgery, psychiatry, neurosurgery, and neurophysiology will comprise the biological section. Psychology, psychophysiology, sociology, and economics will comprise the behavioral section. The emphasis will be upon a broad base of current knowledge about the aging process. Students from any medical discipline are welcome. This course will be interdisciplinary in nature throughout. Two hours, twice weekly for one quarter. To be offered once per year, time of year to be determined. Dr. Busse and Staff.

Psychiatry

History of Psychiatry. A seminar tracing the origins and development of current psychiatric concepts and the influence and contribution of both psychodynamic and biologic orientations. One hour, once weekly for one quarter. To be offered twice yearly, second and fourth quarters. Dr. Spradlin.

Language, Communication and Interviewing. An advanced seminar in interviewing, including verbal and non-verbal communication, formation and resolution of patient resistance, and techniques in the control of the interview situation. Patient interviews and tape recordings will be employed. Two hours, once weekly for one quarter. To be offered twice yearly, first and third quarters. Drs. Hein, Spradlin and Green.

Psychiatry in a Community Context. A seminar on the epidemiology of mental health and illness and on organizational aspects of mental health facilities and services in the community. Two hours, once weekly for two quarters, second and third quarters. Dr. Maddox or Dr. Preiss.

In-Patient Psychiatry: Environmental and Somatic Therapy. An advanced clinical course in in-patient psychiatry covering diagnosis, formulation, and therapeutic management including management of the ward milieu and utilization of nurses and ward personnel in therapy. The student's responsibilities for patient care and therapy are increased in accord with his abilities. Therapeutic Environments and Patient Care is a prerequisite or must be taken concurrently. Full time for one quarter. Offered throughout the year. Drs. Green, Hine and Staff.

Principles and Practice of Out-Patient Psychiatry. This is the advanced clinical course in out-patient psychotherapy. Students will interview patients in the psychiatric out-patient clinic and present the findings of the intake interview at a daily conference where diagnosis and disposition are planned. Students will also be assigned to patients for psychotherapy under supervision by senior and resident staff. Attention will be devoted to the operation of a psychiatric out-patient clinic, its psychiatric teams, and the interaction of the clinic with community agencies and resources. In special cases arrangements may be made for continued supervised therapy beyond the single quarter. Half time (9:00 a.m.-2:00 p.m.). Four days per week for one quarter. Offered throughout the year. Dr. Llewellyn and Staff.

Psychosomatic Medicine. This is the advanced clinical course in psychosomatic medicine which stresses the principles of the psychosomatic approach based on an integration of psychophysiology and psychodynamics illustrated through ward rounds and case conferences.

The student assumes responsibility for selected, individually supervised patient care. Students may choose to concentrate on one specific area, e.g., pediatrics, obstetrics and gynecology, internal medicine, surgery, etc. If the two-quarters course is elected a clinical research project in psychosomatic medicine may be included. Ten hours per week to be arranged with faculty, one or two quarters. Offered throughout the year except summer quarter. Dr. Cohen and Staff.

PSYCHOSOMATIC SEMINAR. A seminar reviewing current concepts of body-mind relationships as they pertain to health and disease. Clinical material and a selective literature review are included. One and one-half hours, once per week for one quarter. Offered twice yearly, second and fourth quarters. Dr. Green and Staff.

SPECIAL TOPICS IN THE PSYCHOLOGICAL ASPECTS OF MEDICINE. A combined clinical and reading seminar intended to clarify the importance of various psychologically-conceived variables in the practice of medicine. Included are psychological test dimensions such as intelligence and abstracting ability, and dimensions of individual difference such as perceptual and cognitive variables. Rounds are conducted to increase the student's awareness of behavioral dimensions in the physically ill patient and their relevance to patient care. Research preceptorships in this area are available following the completion of the structured course. One hour, three times weekly for one quarter. Time of year to be determined. Dr. Eisdorfer.

COMMUNITY PSYCHIATRY AND MENTAL HEALTH. Students will participate in a seminar covering principles of the mental health consultation process with specific reference to the physicians serving it as consultants to individuals, groups or agencies. The student will observe this process in action with a staff psychiatrist. Discussion will include the principles of preventive psychiatry, the structure of community organization, and the role of the psychiatrist and physician in helping the community find ways of meeting its mental health needs. Community resource people will be brought into these seminars when appropriate and field trips to community agencies will be arranged. Psychiatry in a Community Context is a prerequisite. Two hours, twice weekly for one quarter. To be offered twice yearly, first and third quarters. Dr. Llewellyn and Staff.

PRINCIPLES AND PRACTICE OF GROUP PSYCHOTHERAPY. The student will be given an introduction to the principles and application of group psychotherapy. He will observe groups in action and will participate in discussions of observed group processes. Two hours, twice weekly for one quarter. To be offered three times per year, quarters to be determined. Dr. Llewellyn and Staff.

Marriage Counseling in Medical Practice. A seminar dealing with the concepts of marital pathology, sexual behavior in marriage, neurotic interaction in marriage, and the reaction of marriage to stress. Techniques and methods of premarital and marital counseling will be discussed. "Language, Communication and Interviewing" is a prerequisite. One hour, once weekly for two quarters. Time of year to be determined. Dr. Llewellyn and Staff.

Schizophrenia: Research and Clinical Aspects. This literature seminar will review theories of the etiology of schizophrenia, including theories at the biological, individual psychodynamic, communication, and family dynamic levels, and concepts of management and treatment of the schizophrenic patient and the patient suffering from related conditions. One hour per week for two quarters. Time of year to be determined. Drs. Tomlinson and Hine.

Clinical Electroencephalography. Instruction in technique and clinical aspects of electroencephalography. Included are didactic as well as practical instruction in EEG theory and interpretation. Research in clinical EEG may be included. It is recommended that this course be taken concurrently with courses in related areas. Eight hours, two days per week for two quarters. Time of year to be arranged. Drs. Wilson, Green and Staff.

Practice of Psychological Assessment Techniques. Demonstrations and opportunity for practice in the administration and interpretation of psychological assessment techniques with emphasis on the potential utility of these techniques to physicians. One hour, three times per week for one quarter. Time of year may be arranged. Drs. Huse, Krugman and Staff.

Mental Retardation: Birth to End of School Age. A survey of medical, psychological, social, and special education aspects of mental retardation, including clinic evaluation and management approaches. Use is made of existing pediatric, neurologic, endocrinologic and Child Guidance Clinic facilities, and field work at the Murdoch School. (This course is also listed by the Department of Pediatrics.) Two hours, three days per week for one quarter. Time of year to be arranged. Dr. Stedman and Staff.

Mental Retardation: Young Adulthood to Old Age. A survey of the biological, psychological, vocational rehabilitation, and employment aspects of the adult mental retardate. Included are management and planning with families, and sociological problems. Two hours, three times per week for one quarter. Time of year to be arranged. Dr. Stedman.

Emotional Problems of Childhood and Adolescence. This advanced clinical course in child psychiatry surveys major psychological

problems of children and adolescents. The course consists of lectures, conferences, assigned reading, and supervised clinical experience in the Child Guidance Clinic. Half time. Five days per week for two quarters. Offered throughout the year. Dr. H. J. Harris and Staff.

INSTITUTIONAL RESOURCES FOR CHILDREN. A survey of institutional resources in our society for the education and care of children who have special needs. The course includes lectures, reading, discussion, field visits, and observation or supervised service to children in the Wright School, Umstead Hospital Adolescent Unit, Murdoch Diagnostic Clinic, and Child Psychiatry Unit. Two hours, three days per week for two quarters. Time of year to be arranged. Dr. H. J. Harris and Staff.

ALCOHOLISM. A combination of didactic material and contact with a variety of professional personnel and facilities involved in the therapeutic management of persons presenting an alcohol-related problem. Two hours, once weekly for one quarter. To be offered twice yearly, time to be arranged. Dr. Maddox and Staff.

SOCIAL STRUCTURE AND THE LIFE CYCLE: THE ADOLESCENT. A combination of didactic material and clinical experience integrating medically relevant social, psychological, and physiological aspects of an important developmental stage. Two hours, twice weekly for one quarter. To be given twice yearly, time to be determined. Drs. Keith and Maddox.

SOCIAL STRUCTURE AND THE LIFE CYCLE: THE AGED PERSON. A combination of didactic material and clinical experience integrating medically relevant social, psychological, and physiological aspects of another important developmental phase. Included are discussions of the cerebral physiology of senescence and the relation of impaired cerebral physiology to mental function in old age. Two hours, twice weekly for one quarter. Time of year to be arranged. Drs. Busse, Maddox, Obrist and Staff.

GERIATRIC PSYCHIATRY. The course will include lectures, supervised literature review, and clinical work in a variety of settings; in-patient and out-patient psychiatry; private and public hospital; and interview with subjects in retirement homes and in a project concerned with psychiatric factors in the lives of community residents. The focus will be upon geriatric psychiatric diagnosis and management. This course is intended for senior students interested in psychiatry as a career. It is advisable but not required that the individual will have taken the course "Processes of Aging" in the junior year. Research preceptorships in this area are available. Four hours, twice weekly for one quarter. Offered throughout the year. Dr. Busse and Staff.

PRECEPTORSHIPS IN CLINICAL PSYCHIATRY. By personal arrangement with members of the clinical staff it is possible for students to

participate in varying degrees in the professional life of clinical psychiatrists. Various members of the Clinical Staff.

Preceptorships in Clinical Psychiatric Research. Preceptorships may be oriented more toward the participation in or conduct under supervision of clinical research projects. Various members of the Clinical Staff.

RADIOLOGY

During the first two years, radiology is not taught as a separate course but is correlated in many of the established teaching programs. In the first year, this occurs in anatomy, clinical pathology and Physical diagnosis and in the second year in collaboration with the clinical services. Therapeutic radiology is taught in a similar manner. Particular emphasis is given during tumor clinics and conferences. The radioisotope division teaches mainly on the postgraduate level.

X-Ray Elective. This particular aspect concerns the application of roentgenology to clinical diagnosis. In this phase the student will spend the entire working day in the Department of Radiology to observe the various departmental members in their activities. Thus the student will participate in the fluoroscopic studies of the G. I. tract and the heart and lungs, and will follow through certain of the angiographic studies. He will audit routine film readings and thereby participate intimately in the various solved and unsolved problems which arise daily within the department. He will attend the various departmental conferences held in conjunction with numerous other clinical divisions. This is limited to 3 to 5 students for a period of 9 weeks, 5 days a week. All quarters except summer. Radiology Staff.

X-Ray Diagnosis. This course will explore systematically the pathodynamics of roentgen changes as these particular aberrations relate to clinical medicine. This general systems review emphasizes the cardiovascular, pulmonary, and abdominal areas. Certain basic principles will be stressed with no attempt to encompass the entire fields of diagnosis. Two one-hour sessions each week for 9 weeks. Preferably limited to 15 to 20 students to allow significant time for discussion. All quarters except summer. Radiology Staff.

Pediatric Radiology. This course is for students and pediatric house staff who wish more experience in the Radiological Study of Pediatric disease. Daily examination of all films of patients is done with clinical and radiological opinions given and special instruction to the students on the service. The primary emphasis is on the value of radiological studies in making a more definitive clinical diagnosis. One hour daily, 4 times per week for 9 weeks. To be given all quarters. Drs. Reeves and Capp.

RADIATION THERAPY. This course provides additional experience in the study and treatment of malignant disease and certain benign conditions. The interest does not lie solely in therapy. The best interests of the patient are considered in the individual case problems discussed. The role of consultation and care for every cancer patient is stressed and the cooperation of radiologists and surgeons is impressed. Each day's work consists of a general discussion of one area at a time and, when possible, patient demonstrations. This is a one-hour seminar weekly for 9 weeks. All quarters. Drs. Cavanaugh, Worde, Raben, and Reeves.

SURGERY

REQUIRED COURSE

The required course in surgery is given during the second year for a seven week period. Students will be assigned patients on the surgical wards for diagnosis and management. In this course attention will be directed toward basic principles in surgery including diagnostic methods and pre and post operative care. Dr. Sabiston, and Surgical Staff.

ELECTIVE COURSES

BASIC CLINICAL SURGERY. This course is designed to teach the basic principles and concepts of surgery, including surgical physical diagnosis and diagnosis of the acute abdomen, and will include the diseases of the gastrointestinal tract, endocrine organs, proctology, and surgery of hernia. Primary emphasis will be on diagnosis, and students may assist in various operative procedures. The course is nine weeks and will be offered twice yearly. Limited to 10 students. Drs. Shingleton and Peete.

SURVEY OF PULMONARY, ESOPHAGEAL, AND CARDIOVASCULAR SURGERY. This course is a continuation of the students' clinical clerkship with emphasis on thoracic disease. The student will be assigned patients and will be responsible for the clinical history, physical examination, and the preoperative studies. He will scrub at the time of operation and will assist in his postoperative care. Attendance is required at daily rounds with the staff. Assigned reading in this field will be required of each student. The course will require the students' full time for nine or eighteen weeks. All quarters. The course will be limited to 5 students. Drs. Sabiston, Sealy, Brown, Young, and Resident Staff.

SURGICAL ASPECTS OF PULMONARY DISORDERS. The student will be given a more detailed study of pulmonary disease. There will be three parts to the course. The first will be clinical with assignment of one patient per week for examination and follow-up. The student will

be required to search the recent literature concerning the patient's problem and include a brief summary of pertinent references with each. The second part will be concerned with clinical pulmonary function measurements in patients with pulmonary disorders and will be conducted by Dr. H. O. Sieker of the medical service. This will require two afternoons per week, 4 hours each. The student will be expected to participate in actual measurements of pulmonary function in patients coming to this laboratory, and will be assigned required reading relating to this phase of physiology. In the third phase the student will be assigned to the animal laboratory for 4 hours per week. He will be expected to carry out such studies as the effects of hypercapnia, hypoxia on respiratory function; and the effect of paradoxical chest motion, pneumothorax and bronchial obstruction on cardiopulmonary function. Duration of course, full time, nine weeks, limited to 3 students. Drs. Sealy, Young, Brown, Lesage, and Resident Staff.

Surgical Cardiology. The student will be introduced to the various aspects of the surgical treatment of cardiovascular disease and the course is divided into three component parts. First will come the introduction into the techniques of diagnosis, and two periods each week will be spent either in the pediatric or medical cardiovascular laboratory assisting in the clinical evaluation of patients. The student will be taught the basic concepts of extracorporeal circulation by assisting in the operating room with the conduction of open heart operations. In the second part clinical studies will be afforded by examination and follow-up of the patients. At the time of discharge the student will be expected to render a summary of the patient's hospital stay, with a list of pertinent references in recent surgical literature concerning the patient's condition. The third portion will be laboratory exercises in surgical cardiology. This will consist of studies of heart action during open chest, the effect of hypercapnia, hypoxia on heart action, techniques for resuscitation of the heart, and studies of the various types of apparatus used to obtain cardiopulmonary by-pass. In addition, the students will be expected to carry out the various measurements of blood gases and to be familiar with these techniques. Duration of course, nine weeks, two days of 4 hours each per week in the cardiopulmonary laboratory; and 4 hours (one day per week) in the animal laboratory. The remainder of the time will be spent in the operating room and in the care of patients. Number of students 2 to 4. Drs. Sabiston, Sealy, Brown, Young, Lesage, and Resident Staff.

Neoplastic Diseases in Surgical Practice. This course is designed for study of patients with a variety of tumors, including those of the gastrointestinal tract, soft tissue sarcomas, melanoma, and carcinoma of the thyroid and other endocrine glands. The students will

assist in operations on these patients, as well as in their pre and post operative care, and will be allowed to follow patients with these diseases in the private and public outpatient clinics. Diagnosis of malignant tumors and methods of treatment other than chemotherapy will be stressed. The course is nine weeks and will be offered once yearly. Limited to 5 students. Drs. Shingleton, Postlethwait and Peete.

CHEMOTHERAPY OF MALIGNANT TUMORS. This course teaches basic approaches to chemotherapy of cancer. It includes lectures three times weekly in which systematic presentation of the chemotherapeutic agents, their biochemistry and mode of action are presented. The student will have a laboratory exercise in experimental transplantable tumor in animals including treatment with a chemotherapeutic agent. The clinical application of chemotherapeutic agents in the management of cancer, as studied in patients in the private-public surgical outpatient clinics, will give the student first-hand knowledge of the clinical application of these drugs. The course continues for nine weeks and will be offered once yearly. Limited to 8 students. Drs. Shingleton, Byrne, Laszlo, and Mahaley.

HOMOTRANSPLANTATION OF ORGANS. This course will acquaint students with certain basic immunological aspects of homotransplantation of organs and will provide certain background information related to basic concepts in transplantation of tissues and organs. The course is nine weeks and will be offered once yearly. Drs. Stickel and Amos.

SURGICAL DISEASES OF PERIPHERAL BLOOD VESSELS AND LYMPHATICS. This course will acquaint the student with newer techniques and diagnosis and management of peripheral vascular disease, including diseases of the arteries and veins and of the lymphatics. The students will assist in the performance of such diagnostic procedures as lymphangiography and angiography. They will be assigned ward patients with these diseases and will follow such patients in the surgical outpatient clinics. The course is nine weeks and will be offered once yearly. Limited to 5 students. Drs. Silver and Anlyan.

SURGERY FOR HYPERTENSION AND ARTERIOSCLEROTIC DISEASE. This course covers broad aspects of essential hypertension, drugs, sympathectomy, renal vascular hypertension, pheochromocytoma, adrenal cortical tumors, and diseases of the cerebral, coronary, renal and aortic vessels caused by arteriosclerosis and requiring direct arterial surgery. Students will be assigned to the diagnostic laboratories to study patients with these diseases and to participate in their diagnosis and assist at the time of operation. Students will be assigned to the outpatient clinic to view the postoperative results achieved in these patients. The course is nine weeks and will be offered once yearly. Limited to 6 students. Dr. Grimson.

Surgery of Trauma. This course teaches the principles and practice of diagnosis and management of the acutely traumatized patient. Students will be assigned to the Duke Hospital Emergency and Recovery Rooms and will assist in diagnosis and treatment of assigned patients with acute injuries. Lectures and seminars will be held in a coordinated plan to cover trauma of general surgery. The course is nine weeks and will be offered once yearly. Limited to 5 students. Drs. Postlethwait, Shingleton, and Peete.

Basic General Surgery. This course is designed to include the basic aspects of the major surgical diseases, and is given at the Veterans Hospital. Patients will be assigned to the students and time provided to assist at operations. The major emphasis, however, will be on physiologic and pathologic changes, diagnosis, and the indications for operation in these diseases. Special attention will be given to those subjects in surgery common to all medical practices such as the acute abdomen. Full time, nine weeks. All quarters except summer. Minimum 10 and maximum 20 students. Drs. Postlethwait, Dillon, Woods and Resident Staff.

Surgical Subspecialties. This course is designed to give a reasonably thorough study of the surgical subspecialties and is given at the Veterans Hospital. Ophthalmology, Otolaryngology, Neurosurgery, Orthopaedics, Plastic Surgery and Urology. Patients on these services will be assigned to the students and an opportunity provided to assist at operation. Emphasis, however, will be given to diagnosis and pathophysiologic alterations. Full time, nine weeks. All quarters except summer. Minimum 10 and maximum 20 students. Drs. Boyarsky, McCollum, Tindall and Resident Staff.

Pediatric Surgery. The principles of diagnosis and management of surgical diseases of the newborn and of surgical childhood diseases. Students will be assigned to surgical patients on the children's ward for participation in their diagnosis and management of surgical disease. A coordinated group of lectures will cover the general aspects of pediatric surgery. The course will run for nine weeks and will be offered once yearly. Limited to 5 students. Dr. Silver and selected members of the Surgical Staff.

Medical and Surgical Renal Disease. This course will combine experience and instruction in medical and surgical diseases of the kidney and urinary tract, and will be taught jointly by the Division of Urologic Surgery and the Division of Medical Renal Diseases. Students will participate in the pyelonephritis clinic, hypertension clinic, and general urology clinic. Teaching rounds will embrace clinical and experimental problems in renal function, ehmodialysis, renal transplantation, urinary infections, renal hypertension, obstructive uropathies,

nephritides and other congenital and acquired diseases of the urinary tract which are of mutual concern to the internist and urologist. Eight hours, 5 days weekly; nine weeks. Offered twice yearly. Limited to 6 students. Drs. Glenn, Robinson, Gunnells, Boyarsky, Peschel, and E. Anderson.

INVESTIGATIVE UROLOGY. Selected students are given an opportunity to participate in an established program of urologic investigation, dealing with physiology and pathology of the genitourinary system. Both independent and integrated research will be encouraged. Methods and techniques of experimental animal surgery will be taught, and students will be afforded an opportunity to accomplish renal, ureteral, vesical and urinary diversion, renal hypertension, pediatric urology, and urologic endocrinepathies. Students with interest in any area of clinical surgery are encouraged to participate. Four hours, 6 days weekly; nine weeks. Offered continuously. Limited to 4 students. Drs. Glenn, Dees, and Staff.

BASIC NEUROSURGERY COURSE. Those disease conditions which are commonly encountered in a neurosurgical practice are presented. A clinical presentation of a common neurological disorder such as brain tumor, head injury, etc., is made by a member of the staff in neurosurgery. Clinical features and a plan of diagnostic investigation are stressed. The clinical disorder is then used as a focal point from which to carry the presentation into the basic science area related to the clinical problem. For example, the neuropathologist will discuss the pathology of brain tumors after the clinical features of the condition have been covered by the neurosurgery staff. Occasionally, related clinical disciplines will discuss the clinical problem being presented. Two hours each week. Duration of course, nine weeks. Offered three times each year. Limited to 20 students. Neurosurgery Staff and Staff of related subspecialties including Neuropathology, Neuroanatomy, Neurology, Neuroendocrinology.

CLINICAL NEUROSURGERY. This course is designed for those students with future interest in the neurological sciences. The student becomes in practice an extern on neurosurgery as he rotates through the neurosurgical service with essentially the same responsibilities as an intern. Duties include the work-up and care of inpatients, work-up of clinic patients, assistance in the operating room, routine post operative care, daily rounds, and night call. The student is expected to attend the weekly conference in neurology, neuropathology, and neuroradiology, and the neurosurgery lecture given to the house staff at 8:00 a.m. each Saturday morning. During this period, each student is required to write a thesis based on a clinical subject. Course is full time for a nine week period. Limited to 2 students each nine week period. Dr. Odom and Neurosurgery Staff.

Investigative Neurosurgery. In this course the student is assigned a project relating to the neurological sciences and is provided with the technical help, recording equipment, and experimental animals necessary for its completion. This course specifically will *not* make the student into just another lab assistant. Instead, each student plans and executes his own individual project, with the help of the neurosurgery staff. Laboratory space is available and clinical and experimental research projects in neurophysiology and cerebrovascular physiology are currently in progress. The student is expected to attend weekly conferences in neurology, neuroradiology, and neuropathology, and the weekly neurosurgery lecture given to the house staff at 8:00 a.m. each Saturday morning. Course is full time for a given period. To be offered three times a year for 18 weeks. Limited to 2 students each 18 week period. Dr. Odom and Neurosurgical Staff.

General Ophthalmology. Participation in regular House Staff activities, including instruction in the use of such specialized apparatus as the slit lamp, indirect ophthalmoscope, retinoscope, perimeter, and phoropter afford an overall view of the specialty. Each student will spend a part of each day assisting in the operating room or in the clinic and will be expected to attend Ophthalmology teaching rounds. The course will run full time for nine weeks and will be open to not more than 2 students for each nine week period. Dr. Anderson, Jr.

Medical Ophthalmology. Ophthalmic signs and symptoms of systemic diseases are presented by means of illustrated lectures and by the opportunity to examine suitable patients. Of interest to students in any field of clinical medicine, this course requires skill only with the direct ophthalmoscope. Emphasis is on the diagnosis of systemic diseases by recognition of their ocular manifestations. Four hours once weekly for nine weeks. Limited to 20 students. Dr. Anderson, Sr.

Basic Ophthalmic Sciences. A postgraduate course designed primarily for those intending to specialize in Ophthalmology, this course covers optics, ocular anatomy, ocular physiology, ocular pathology, ocular pharmacology, and the physical basis of photocoagulation, radiotherapy, and enzyme therapy. Undergraduates must obtain permission to register from a member of the Ophthalmology Senior Staff. Given each Tuesday night (7:30-9:30 p.m.) during the academic year (September through May). Any number of students. Dr. Anderson, Jr., and the Ophthalmology Staffs of N. C. Memorial and McPherson Hospitals.

Refraction. The purpose of this course is to train the students to become an adequate if not adept refractionist. Instruction in the use of the phoropter, astigmatic dials, lensometer, trial lens sets, and retino-

scope is given. Full time (8 hours daily) for nine weeks. Limited to one student each period. Dr. Anderson, Sr.

NEURO-OPHTHALMOLOGY. Experience is provided in the application of ophthalmic diagnostic techniques to the diagnosis of central nervous system diseases. Instruction in perimetry, Lancaster motor field testing, use of the amblyoscope, stereocampimetry, ophthalmodynamometry, and measurement of ocular muscle imbalances is given. After instruction in these techniques the student will assist in the examination of patients with central nervous system problems. By arrangement with the Divisions of Neurology or Neurosurgery, course time may be split with either of these specialties. Eight hours Tuesdays and Thursdays for nine weeks. Limited to one student each period. Dr. Anderson, Jr.

OPHTHALMIC PATHOLOGY. Once weekly the student reviews the ophthalmic pathology specimens submitted the preceding week and assists in collecting the case histories for presentation at the monthly Ophthalmic Pathology Conference. Prerequisites for this course are either the course in General Ophthalmology or the course in Basic Ophthalmic Sciences. Four hours weekly for 18 weeks. Limited to one student. Drs. Anderson, Jr., and Klintworth.

GENERAL OTOLARYNGOLOGY. This is a clinical otolaryngology course. The students participate in the outpatient clinic activities and in the management of patients in the hospital. They are expected to participate in the work-up and management of patients admitted to the Otolaryngology Service and to assist in the operating room. Participation in the Otology Program acquaints the student with audiometric techniques. Diagnosis and management of head and neck cancer will be covered and the student will attend the Head and Neck Cancer Clinic in the Division of Radiation Therapy. Each student will be required to submit a paper dealing with some aspect of Otolaryngology. This course would be especially valuable to those interested in Neurosurgery, Ophthalmology, Neurology or Pediatrics. Full time, nine weeks. To be given every nine week period. Limited to one to two students. Drs. Greenwood, Kenan and Hudson.

MEDICAL AUDIOLOGY AND SPEECH PATHOLOGY. Students will primarily be working in the Hearing and Speech Clinic. Special attention will be given to advanced audiometric techniques including instruction in the use of the Bekesey and PGSR audiometry. Emphasis will also be placed on vestibular mechanisms and testing. The student will also spend some time with the speech pathologist observing methods of diagnosis and management of the various speech problems. Contact with clinical Otolayrngology will be maintained. Four hours, 5 times a week for nine weeks. Given every nine week period. Limited to one to two students. Drs. Lynn and Massengill.

Otophysiology Lecture Series. This course is didactic and will be offered to the residents as well as to students. Lectures on auditory and vestibular physiology will be given. The Department of Psychology will participate in this lecture series particularly emphasizing psychoacoustics and conditioned responses. In all probability this course will be given in the evenings. It will be primarily aimed toward Otolayrngology residents and graduate students in Psychology but any number of interested medical students will be accepted. One hour weekly for 18 weeks, given once yearly. No limit to number of students. Drs. Greenwood, Diamond and Hudson.

Otolaryngology Lecture Series. In this one or two hours weekly lecture series general Otolaryngology will be covered with the emphasis on clinical aspects. This will be entirely a didactic lecture course and at the conclusion an examination will be given. This lecture course will be essentially the same course as offered now to senior students. One hour per week for 18 weeks. To be given two times yearly. No limit to number of students. Drs. Hudson and Kenan.

Reconstructive Plastic Surgery. This course would give the interested student a concentrated course in reconstructive surgery—the equivalent of an intern; operating, emergency and dressing rooms, clinics—private and public, ward assignments, lectures, demonstrations, etc. This course would include patients with the following conditions: congenital malformations of the face, hands, recto-genital systems, acute facial and peripheral trauma, burns, paraplegics, esthetic surgery, cancer of the face, oral cavity and neck, reconstructive surgery following trauma and disease. One student can be accommodated on a full time basis for each nine weeks. Drs. Pickrell, Georgiade and Plastic Surgery Staff.

Physiology and Bacteriology of Healing Wounds. This course is designed for the student who is interested in the physiology and bacteriology of healing wounds. The student is assigned to the dressing rooms daily, Monday through Friday, where he has an abundant opportunity to study the bacteriology and physiology of healing wounds—acute trauma, following excisional surgery and following many types of grafting and reconstructive procedures. The effects of various antiseptics and local applications of emollients could be studied in conjunction with their possible bacteriocidal or bacteriostatic effects. Four hours (8:00 a.m. to 12 noon) 5 times a week for nine weeks. Limited to 1 student for each nine weeks. Drs. Pickrell, Georgiade, and Plastic Surgery Staff.

Speech and Hearing Problems in Children with Clefts of the Lip and Palate. The student who is interested in speech and hearing problems in children, especially as they relate to children with clefts of the lip and palate, is given an abundant opportunity to learn

and work in the Speech and Hearing Laboratories and the Child Guidance Clinic. Methods of evaluation, testing and remedial measures would be studied intensely. Three hours (2:00 p.m. to 5:00 p.m.) 5 times a week for nine weeks. Limited to one student. Drs. Massengill (speech); Lynn and Hudson (audiology); Quinn and Wentz (orthodontics); Pickrell, Georgiade and Staff (plastic and reconstructive surgery).

ANESTHESIOLOGY—APPLIED PHYSIOLOGY AND PHARMACOLOGY. This course will allow application of the principles of respiratory and cardiovascular physiology to therapeutic practice in patients. By means of lecture-demonstrations, followed by direct participation, students will evaluate and discuss: (1) physiologic techniques of ventilation, (2) the efficacy of various mechanical ventilators, (3) the value of respiratory resuscitation, (4) the importance of cardiac resuscitation, (5) the significance of therapeutic and diagnostic nerve blocks, (6) the actions of anesthetic drugs, (7) the effects of vasopressor and cardiac stimulant drugs, and (8) the action of analeptic drugs. Three hours, 5 times a week for nine weeks. To be given twice a year. Limited to 10 students. Entire anesthesia staff.

ANESTHESIOLOGY—PRINCIPLES AND PRACTICE. This course is an introduction to the role of the anesthesiologist in the care of hospitalized patients. It includes: (1) six weeks of active administration of clinical anesthesia under direct, close supervision with the student actively evaluating the responsibilities of the anesthesiologist, and familiarizing himself with the techniques and drugs employed, (2) one week in the Recovery Room and in exposure to obstetric anesthesia, observing, diagnosing, and treating immediate postoperative complications, and participating in methods of pain relief for obstetric delivery, (3) one week in Inhalation Therapy Division evaluating the practical aspects of oxygen administration, and utilization of mechanical ventilators for acute and chronic therapy, (4) one week in Anesthesia laboratory practicing techniques of monitoring vital signs (blood pressure, venous pressure, respiration, electrocardiogram, electroencephalogram, means of determining pH, pCO_2 and pO_2 of blood and respired gases) utilizing such modern techniques as infrared analyzers, chromatography, and specific electrodes. Experiments will illustrate resuscitative techniques and hazards of certain drug combinations. Full time for nine weeks. To be given each quarter. Limited to 8 students. Entire anesthesia staff.

ANESTHESIOLOGY RESEARCH. This course teaches techniques utilized in clinical and laboratory research in anesthesiology. In collaboration with the faculty, the student will work on a research project

related to the physiology or pharmacology of anesthetic practice. A wide range of facilities is available for the measurement of respiratory and circulatory parameters, both in animals and in man. Full time for nine weeks. To be given each quarter. Limited to 2 students. Drs. North, Hall, and Stephen.

Medical Speech Pathology. This course will emphasize diagnostic and rehabilitation treatment used with the patients who will be seen in the Medical Center. The following conditions will be reviewed: articulation disorders, delayed speech development, cleft palate, stuttering, voice disorders, aphasia, cerebral palsy, language disorders, mental retarded speech, lisping, oral inaccuracy, laryngectomy, and other disorders of speech not falling under one certain category. The role the physician plays in the total rehabilitation of the speech-impaired patient will be stressed. Three hours four times a week for nine weeks. All quarters. Dr. Massengill.

Research in Medical Speech Pathology as Applied to Reconstructive Plastic Surgery. This course is designed to present a composite analysis of research techniques used by the speech pathologist with reconstructive plastic surgery patients that possess organic speech problems. Certain emphasis will be placed on cinefluorographic investigation and speech results achieved by different surgical procedures. The use of different speech appliances will also be reviewed. The course will deal with the organization and administrations of speech pathology research programs coordinated with reconstructive surgery departments. Three hours four times a week for nine weeks. All Quarters. Dr. Massengill.

General Orthopaedics. This course is a comprehensive introduction to Orthopaedic Surgery designed primarily to broaden the student's understanding of the specialty. It consists of full or part-time experience in the Orthopaedic service, daily contact with the staff and house officers, and duties similar to those of the junior intern including care of in-patients, out-patient experience, and work in the operating room. The student attends all conferences and rounds, has an opportunity to visit with staff members at the State Crippled Children Clinics in various areas of North Carolina, and to observe the participation of the State and local Health and Welfare Departments and Vocational Rehabilitation Counselors in a well-established rehabilitation program with close personal contact of those participating with each agent fully familiar with the problems. Emphasis is placed on the care of the patient, however, part-time experience with Orthopaedic Fellows in Anatomy and Pathology is available. The overall purpose of the course is to develop a broad concept of Orthopaedics, particularly for those students planning a career in general practice or pediatrics, to teach practical tech-

niques to those students interested in allied surgical specialties, and to give those students interested in Orthopaedics as a specialty an opportunity to evaluate all phases of such a career. Time, flexible, part or full-time, 4 to 9 weeks. Limited to 4 students. Orthopaedic staff.

OFFICE ORTHOPAEDICS. An introduction to out-patient Orthopaedic problems, patient examination, disability evaluation, and the management of compensation-liability problems and establishment of medico-legal contact with emphasis on record-keeping and office management. Half time, five afternoons per week, limited to four students. Associated staff in practice in Durham and Duke staff.

ORTHOPAEDICS IN THE COMMUNITY HOSPITAL. This course is similar to those above, with more emphasis on the private practice of Orthopaedics, especially as an office consultation service in a community including the coordinating of office practice, emergency room, and hospital services. This course is conducted in the offices of the Associate Orthopaedists in Durham and at Watts and Lincoln Hospitals. Time, flexible, 4 to 9 weeks. Limited to 4 students. Drs. Bugg, Glasson, Coonrad, and Kapoor.

CEREBRAL PALSY. Opportunities are available in this field both for clinical experience and laboratory investigation in cerebral palsy and general children's Orthopaedics. The course is given at the North Carolina Cerebral Palsy Hospital and the Duke University Medical Center. Students participate in rehabilitation and occupational therapy and diagnostic conferences and rounds, with opportunity to observe psychological evaluation of the handicapped and the handling of family problems. In addition, the student observes and assists in the surgical care, bracing, and rehabilitation of these patients. Time, flexible, part or full-time, 4 to 9 weeks.

Adequate Fellowships with full support are available through the United Cerebral Palsy Foundation both for clinical work and investigation. Time, 9 weeks, full time.

CLINICAL CONFERENCES IN CEREBRAL PALSY. These Conferences are arranged for the benefit of students primarily interested in neurological diseases, pediatrics, and related fields. This part-time opportunity is available throughout the year. 11:00 a.m. to 12:00 noon on Mondays and 10:00 a.m. to 12:00 noon on Wednesdays at the North Carolina Cerebral Palsy Hospital. Dr. Baker, Dr. Bassett, and N.C.C.P.H. Staff.

SURGERY OF THE HAND. This course is a part-time clinical experience emphasizing didactic and functional anatomy of the hand, evaluation of the injured upper extremity and reconstructive hand surgery.

Opportunity to carry out investigation, particularly clinical surveys, is available if desired. Schedule is flexible. The course is limited to 2 students, 9 to 18 weeks. Dr. Goldner.

Orthopaedic Aspects of Arthritis. A clinical experience in adult and children's rheumatology in conjunction with the Department of Medicine. The student attends rheumatology conferences, rounds, and clinic. Opportunity is available for investigative work through the rheumatology program. (See Rheumatology under Medicine.) Surgical experience can be arranged through Dr. McCollum. Time can be arranged according to the student's interests and desires. Dr. McCollum and Medical Rheumatology Staff.

Athletic Medicine. The course stresses the importance of the care of playground high school and college athletic injuries. The course content, although dealing with Orthopaedic and traumatic problems, is directed at preparing doctors who plan to practice general medicine or surgery and think they would enjoy participating in their community's school programs. In addition to the specific Orthopaedic and traumatic therapy, lectures and experience in conditioning dieting, protective equipment, prevention and care of athletic injuries, will be included. Practical experience will be available in the training rooms of the Duke University Department of Athletics and on the athletic fields at the University and the local high schools. Limited to 2 students, half-time. Given during the first and second quarters, 9 weeks. Approximately 3 afternoons a week plus Friday evenings and Saturday afternoons. Drs. Baker, Clippinger, Bassett, and the Physical Education Staff.

Electromyography. This course is an introduction to electrodiagnosis techniques and theories and practice of clinical electromyography. It consists of lectures, patient, and laboratory demonstrations. Individual projects directed at the study of specific diseases of the neuromuscular system may be arranged. The course is given each term for 9 weeks, limited to 4 students for one hour per week. Additional time can be arranged for special projects. Dr. Clippinger.

Research in Orthopaedics. This course gives the student an opportunity to spend part or full time in laboratory investigation or clinical research in Orthopaedics and related fields. In the main it will consist of individual projects with experience in investigations currently in progress in Orthopaedics at the Medical Center, Veterans Administration Hospital, and the North Carolina Cerebral Palsy Hospital. Hours and length of study, of necessity, are flexible and vary from time to time and according to available projects and the student's interest and desire. Orthopaedic Staff.

Rehabilitation of the Amputee. In this course the student's training is directed at developing a full knowledge of the basic principles of amputation, post-operative care, and psychological adjustment,

through weekly Amputee Clinics at the Duke University Medical Center, the Durham Veterans Administration Hospital, and the Veterans Administration Regional Office in Winston-Salem. Special training is offered in the mechanics of prosthetics, their manufacturing, and instruction in prescription, fitting, and theories of their use. The experience is offered in the Orthotics and Prosthetic Shop, Physical and Occupational Therapy, Rehabilitation, and Vocational Placement. Three half-days per week for 9 to 18 weeks. Drs. Goldner and Clippinger, Mr. Titus, Miss Kaiser, and the Duke Prosthetic Shop and Physical Therapy Staffs. Limited to 4 students.

INTRODUCTION TO FRACTURES. This course offers the student an opportunity to participate in the emergency and follow-up care of fractures at the Duke Medical Center and Watts and Lincoln Hospitals, where, by special arrangement, he may be on emergency call. In addition, he attends and participates in Fracture and Plaster Clinics and ward rounds, at the Medical Center on Friday a.m., at Watts Hospital on Saturday a.m. Extent of participation by special arrangement. Time is flexible. Limited to 4 students. Medical Center and Watts Orthopaedic Staffs.

CHILDREN'S ORTHOPAEDICS. This course is directed primarily at acquainting students interested in Orthopaedics or Pediatrics in the basic problems associated with congenital abnormalities and other Orthopaedic problems of childhood. In addition to the experience available at the North Carolina Cerebral Palsy Hospital and Duke University Medical Center, student internships are available at the North Carolina Orthopaedic Hospital and at the Shriners' Hospital for Crippled Children. For those students particularly interested in children's Orthopaedics, the internships are available for 9, 18, or 36 weeks on a full-time basis with opportunity to participate in all the activities at the hospitals. The student internships are particularly recommended for those interested in Pediatrics.

In addition, by special arrangement, one student at a time may attend any or all of the following Crippled Children's Clinics sponsored each month by the Chrippled Children's Division of the North Carolina State Board of Health as follows:

1st Thursday—Roanoke Rapids—Drs. Bugg and Coonrad
1st Friday—Lumberton, followed by visit to McCain Hospital—Drs. Goldner and Clippinger
2nd Friday and the Saturday following the 2nd Friday—Clinton and Morehead City respectively—Drs. Baker and Bassett
3rd Thursday—Goldsboro—Dr. Roberts of the North Carolina Orthopaedic Hospital and Drs. Goldner and McCollum
3rd Thursday—Halifax—Drs. Bugg and Coonrad
Friday following 3rd Thursday—Ahoskie—Drs. Baker and McCollum
Last Friday—Wilson—Drs. Baker and Bassett

By special arrangement, more than one student may attend any or all of the above Clinics.

UNDERGRADUATE CANCER TRAINING PROGRAM

(Supported by a grant-in-aid from the USPHS)

The Cancer Undergraduate Training Program is designed to improve the teaching of cancer to undergraduate medical students. Special teaching and demonstration on tumors is started during the student's course in Pathology and is continued into the clinical years. All clinical departments provide clinics, conferences and seminars which are designed to provide in depth an understanding of the nature, diagnosis, natural history and treatment of malignant tumors. In addition, special seminars with outstanding cancer authorities from other institutions in the country are arranged annually. Selected staff members in the various clinical departments are involved in teaching in this program, which is continuous throughout the medical school year.

The student is instructed in cancer problems by ward assignments, tumor clinics for the undergraduate student, and special lectures and courses given by various departments. During the third year, the student studies ward patients with a clinical instructor from the departments of surgery, obstetrics and gynecology or pediatrics. The student participates in all phases of the care of patients with cancer (diagnosis, pre- and post-operative care, and assisting in the operation). He observes the lesion in situ, examines it in the fresh state, follows the specimen through the pathologic laboratory, and studies the prepared slides for microscopic appearance, thereby learning pathology techniques and checking on the accuracy of his own diagnosis. Interdepartmental tumor clinics offer combined teaching by the pathologist, radiologist, surgeon, gynecologist and pediatrician, and teach the student the techniques and value of each of these disciplines, as well as giving the student a comprehensive review of the special cancer problems. Special courses given by the radiology and pathology departments teach the use and value of diagnostic and therapeutic x-ray and diagnostic surgical pathology in handling the cancer patient.

The training program is supplemented by a tumor registry where accurate follow-up records are kept with the results summarized and made available to staff and students. Thus they can know the year by year results of treatment of large numbers of patients as expressed in percentages of those (1) free of recurrence, (2) apparently cured, (3) having a recurrence, or (4) dead of recurrence at varying times after onset of the disease and the institution of therapy.

VETERINARY MEDICINE

The function of this Department is to facilitate the various teaching and research programs that require laboratory animals. Veterinary medical consultation is provided for research projects in which experiments are conducted on animals. Assistance is made available in selecting the most suitable species or strain of laboratory animal to use in a given study. In addition, animals are procured, quarantined and appropriately conditioned in order to provide a highly reliable biological tool. A wide variety of technical services are carried on, such as providing whole blood of a variety of species, collecting biological specimens, providing clinical pathologic examinations, preparing animals for surgery, post-surgical care, and maintenance of the animal colonies.

The department collaborates with those departments of the School of Medicine that utilize laboratory animals in their teaching programs. Various disease states are experimentally produced in animals for student observation and study and techniques for collecting of biological specimens for additional study are demonstrated. Aid is given in setting up and carrying out these demonstrations and studies on animals.

A post-doctoral training program in laboratory animal medicine has been initiated and plans are under way to increase the number of available training positions.

Although the department is in an early stage of development, research is under way on some of the spontaneous diseases of laboratory animals.

Duke Hospital

INTERNSHIPS AND RESIDENCIES

Straight internships of one year duration are available in Medicine, Surgery, Pathology and Pediatrics, and two mixed internships are offered in Obstetrics and Pediatrics. Appointments are from July 1 through June 30 with few exceptions. Interns receive a stipend of $220.00 per month, with uniforms and laundry of uniforms provided. Application forms and information for internships, residencies or available fellowships may be obtained by writing to the Chairman of Department, Duke University Medical Center, Durham, North Carolina. Both men and women graduates of any Class A Medical School are eligible for appointment. While internships are rarely available to graduates of medical schools outside the United States and Canada, a limited number of residencies and research fellowships are available from time to time in which case certification by E.C.F.M.G. (Educational Council on Foreign Medical Graduates, 1710 Orrington Avenue, Evanston, Illinois) is prerequisite.

Duke University Medical Center is a participating member of the National Intern Matching Program, 2530 North Ridge Avenue, Evanston, Illinois, and all applicants must register with this program. The Hospital is a member of the American Hospital Association, is approved by the American Medical Association for internship and residency training, and is fully approved by the Joint Commission on Accreditation of Hospitals.

The Duke University Medical Center is an integral part of Duke University which makes its educational, recreational and athletic facilities available for the Resident Staff.

The Durham Veteran's Administration Hospital adjoins the Duke University Campus, and is operated under the supervision of the Dean's Committee of the Duke University School of Medicine. The full time professional staff of the Veteran's Hospital are all members of the School of Medicine faculty. All training programs are integrated with corresponding programs at Duke University Medical Center, which includes rotating of House Officers to each hospital from time to time.

POSTGRADUATE STUDY

Graduates in medicine are welcomed at the various specialty clinics in Medicine, Surgery, Obstetrics, and other specialties from 9:30 A.M. to 12:30 P.M. each morning except Sunday.

Ward rounds are given in Medicine in the mornings as general Out-Patient Clinics are in session in the afternoon. Throughout the entire year there are concentrated formal types of Postgraduate instruction in the way of Symposia and study groups. These include subjects for the generalist as well as for the various specialties. Announcements concerning these Symposia will be made from time to time.

Paramedical Courses

SCHOOL OF CYTOTECHNOLOGY

The School of Cytotechnology at the Department of Pathology offers a 12 month course in technical and diagnostic aspects of exfoliative cytology to qualified individuals. The minimum qualifications are 12 semester hours of biology, which may include anatomy, histology, zoology, botany, and physiology; and at least 2 years of college. The common practice is to admit individuals with B.S. or A.B. degrees and only in exceptional cases applicants with incomplete college requirements will be considered.

The program consists of two parts. Part I—6 months, primarily theoretical and practical exercise in the techniques of exfoliative cytology and interpretation of the clinical material. Part II—6 months practical training in all aspects of exfoliative cytology in participating in the routine work of the laboratory. One class is accepted annually on January 1. Graduates of this course are awarded a certificate and are eligible to take the certifying examinations given by the Registry of Medical Technologists of the American Society of Clinical Pathologists. There is no tuition fee. Additional information about the School of Cytotechnology and applications for admission may be obtained from J. V. Klavins, M.D., Department of Pathology, Duke University Medical Center, Durham, North Carolina.

DIETETICS

A Dietetic Internship program is offered to men and women who have graduated from college in Food and Nutrition or Institutional Administration and meet the course requirements of the American Dietetic Association. The 12 months of post baccalaureate work consists of classroom instruction and clinical experience in administration, therapeutics, research and education. After the successful completion of the Dietetic Internship, certificates and membership into the American Dietetic Association are awarded. For further information write:

Department of Dietetics
Duke University Medical Center
Durham, North Carolina

HOSPITAL ADMINISTRATION

Graduate education for hospital administration is offered through a 24-month program conducted jointly by the Graduate School of Arts

and Sciences and the Medical Center. The Program consists of selected graduate courses in Economics, Political Science, Sociology, and Hospital Administration, and of a 12-month administrative residency in hospitals and other health agencies. The Master of Hospital Administration degree is awarded to those who successfully complete the Program.

Detailed information may be obtained from:

Graduate Program in Hospital Administration
Box 3018
Duke University Medical Center
Durham, North Carolina

MEDICAL ART AND ILLUSTRATION

The primary function of this division comprised of artists and photographers is to produce a wide variety of visual aids for members of the Medical Center staff. Due to the ever increasing need within the University, and as no similar service is available, this Division also offers its services to the University Faculty as a whole. The illustrations produced through art and photography are used for teaching aids (including exhibits), illustrating papers or books for publication, recording research data and enhancing hospital and administrative records. Services offered by this Division are: 1) Medical Art Section: Illustrations produced by various art methods and techniques, of subjects seen or unseen, and even the theoretical, limited only by the available equipment and talents of the artists. Services rendered: a) Schematic and mechanical drawings, diagrams, charts, graphs, designs, lettering, signs, casts, models and exhibits, and b) many other forms of illustrations normally ascribed to an artist. 2) Medical Photography Section: Photographic illustrations through various photographic methods and techniques limited only by the available photographic equipment and the talents of the photographers. Services rendered: a) Still and motion pictures, pictures of the retinae, photographic copies, transparencies, film strips, lantern slides, enlargements, and contact prints, b) Medical Center staff and student pictures for administrative records are made by this section and c) many other forms of illustrations normally ascribed to a photographer.

Under the direction of this division, services offered directly to the patient are: Production of facial prostheses used to replace missing anatomical parts, and instruction in the use of opaque cosmetics used to cover skin discolorations.

Facilities for individual instruction in, or demonstration of specific techniques and methods employed by this division, as well as instruc-

tion in the proper use of standard projection equipment are available to students and faculty of the University. No academic credit is given. Prerequisites, fees, time and type of instruction will be determined by the Chairman of this Division. Duke University does not have a school of medical art or medical photography and this division does not offer any formal courses in these fields of endeavor.

MEDICAL TECHNOLOGY

The School of Medical Technology offers a twelve-month internship program of instruction and rotation through the clinical laboratories of the Duke University Medical Center and the Veterans Administration Hospital.

The Internship program is open to men and women who have either a baccalaureate degree or a minimum of 3 years of college (in an accredited college or university) with plans for receiving such a degree from the preparatory college upon completion of the Internship program. Applicants must have successfully completed at least 90 semester (135 quarters) hours which include:

Chemistry: minimum of 16 semester hours (24 quarter hours) which includes one full year of general college chemistry. The remaining courses may be selected from qualitative, quantitative, organic, physical or biochemistry. (One semester of quantitative analysis is strongly recommended.) All courses must include lectures and laboratories.

Biological Sciences: minimum of 16 semester hours (24 quarter hours). All required biological sciences must include lecture and laboratories. Courses may be selected from general biology, zoology, botany, physiology, comparative anatomy, parasitology, histology, histologic technic, genetics or bacteriology. (Bacteriology is strongly recommended.)

Mathematics: minimum of 3 semester hours.

Courses in physics are recommended but not required. Electives may be selected from English, Social Sciences, Arts and Humanities.

Courses taught during the Internship include Clinical Biochemistry, Clinical Microscopy, Radioisotope theory, Microbiology (Bacteriology, Mycology, Virology), Immunohematology, Parasitology, Introduction to Clinical Pathology, Serologic technics and Histologic technics. (Classes begin on July 1.)

Students are given a certificate upon completion of the Internship program and are qualified for examination and certification by the Registry of Medical Technologists of the American Society of Clinical Pathologists. They are eligible for membership in the American Society of Medical Technologists. This program is approved by the Council

on Medical Education and Hospitals of the American Medical Association.

A $25.00 non-refundable registration fee is required upon acceptance in the program. This is applied towards the $50.00 breakage fee which is payable upon entrance. Students will be furnished rooms in dormitories and will receive a grant-in-aid of $100 a month. Students are required to participate in the Hospital Insurance plan, furnish their own white uniforms, white shoes, and meals. Laundry of uniforms is furnished by the Medical Center. Students can expect to spend $50-$75 for books during the year.

For further information and/or application blanks, write to: Registrar, School of Medical Technology, Department of Pathology, Duke University Medical Center, Durham, North Carolina 27706

NURSE ANESTHESIA

The twenty-four months course in anesthesia is available to well qualified registered nurses. Instruction embraces the theoretical aspects and clinical application of all drugs and techniques in accepted usage. The program is divided into quarters. The major part of the basic theoretical instruction is given during the first three quarters. After a preclinical period of eight weeks, clinical practice runs parallel with the theoretical program. One class is accepted annually and enrolled January 15. All appointments of the current year are made by September 1 of the preceding year. Graduates of this course are eligible to take the qualifying examination for membership in the American Association of Nurse Anesthetists. Tuition is $150.00. Additional information concerning nurse anesthesia may be obtained from Mary B. Campbell, C.R.N.A., P.O. Box 3204, Duke University Medical Center, Durham, North Carolina.

PHYSICAL THERAPY

The Curriculum in Physical Therapy at Duke University is conducted under the joint auspices of the Graduate School of Arts and Sciences and the Medical Center.

Two programs are offered: 1) The Program leading to a Certificate in Physical Therapy and a Master of Arts Degree. This is in two phases: (a) In the first year the necessary credit courses may be selected from the following: Anatomy M201, 6 units; M202, 3 units; M203, 4 units; M205, 2 units; M313-314, 2 units; Physiology M261-262, 8 units; Psychology S232, 3 units; M279, 1 unit; M370, 2 units; M372, 3 units; Biochemistry 201, 3 units; Zoology 252, 4 units; 245, 3 or 4 units; 271, 4 units. (b) In the second year in addition to the thesis, the physical therapy procedure courses listed in program two and

practicum may be completed. Upon completion of the total two year program a Certificate in Physical Therapy and a Master of Arts Degree are awarded. 2) The Certificate Program. A baccalaureate degree or a plan for receiving such a degree from the preparatory college upon completion of the physical therapy program is essential for admission. The program includes basic science courses from those listed in program one in addition to courses in kinesiology, pathology, physical therapy and rehabilitation as related to the medical and surgical specialties, administration, ethics and physical therapy procedure courses. Sixteen weeks of clinical experience are provided on a rotation basis at Duke University Medical Center, affiliated hospitals, and state and county health departments. The entire curriculum including the practice may be completed in fifteen months.

Prerequisites for both programs are basic courses in psychology, mathematics through trigonometry, and one year laboratory courses in chemistry, a biological science exclusive of botany, and physics covering the principles of heat, mechanics and electricity. In addition, those undertaking the Master of Arts Program must meet the requirements of their selected major.

Tuition and health fees are $1,200 for the fifteen month's certificate program. For the program leading to a Master of Arts degree the cost is approximately $1,800. Scholarship and loan funds are available. Graduates of either program are eligible for state and national licensing and registration examinations and membership in the American Physical Therapy Association. For further information write to the Director of Physical Therapy, Box 3247, Duke University Medical Center, Durham, North Carolina.

RADIOISOTOPE TECHNOLOGY

The Radioisotope Division offers a three month training program of instruction and laboratory training for clinical radioisotope technicians, and a six month training program of instruction and laboratory training for research radioisotope technicians. This training includes work in all areas of the Radioisotope Division.

An applicant for admission must be a graduate of an approved high school and board certified (or eligible to take board examinations) in Medical Technology or X-ray Technology. Equivalent training and experience may be substituted for this requirement. A registration fee of $100 is required. This fee includes tuition, and diploma fee for the course. For further information address inquiries to: Mrs. Kathryn W. Sharpe, Instructor in Radiology (Radioisotope Division), Box 3166, Duke University Medical Center, Durham, North Carolina.

RADIOLOGIC TECHNOLOGY

The school of Radiologic Technology offers a two year training program of instruction and practical training in all divisions of the Department of Radiology. Students are admitted the first Wednesday in September for two years of intensive training in the academic and practical aspects of Radiologic and Therapeutic technique. During the second year the students are paid a stipend of $100.00 per month. Upon completion of the course the students are required to take the National Board Examinations in Radiologic Technology sponsored by the American Registry of Radiologic Technologists. The school is approved by the Council on Medical Education of the American Medical Association, the American College of Radiology, the American Registry of Radiologic Technologists and the American Society of Radiologic Technologists. Candidates for admission must be graduates of approved high schools and rank in the upper third of their class. Candidates with college credits are given preference. Official transcripts of high school and/or college grades, a list of three references and a recent photograph must be included with the application before being considered by the Committee on Admissions. It is recommended that the applicants be at least 19 years and not more than 30 years of age at the time of enrollment. Experience has shown that courses in physics, chemistry, biology, and physiology are very helpful in preparation for a career in Radiologic Technology. A personal interview is required before final selection of students is made. Full time attendance is required in both the classroom and practical work. Night and weekend call duty are required. Class periods are for one hour per day five days per week, September through May. The remaining time is spent on a rotation schedule through all phases of technological activities. Periodic examinations are given as a test of progress. Students must maintain a satisfactory average in the academic and the practical aspects of the program to be awarded a diploma. Conferences are held on Thursday afternoons from September through May and various other conferences are scheduled from time to time. Clinical experience is done under supervision of full time registered x-ray technologists, staff radiologists and resident radiologists. Two weeks vacation and one week sick leave is allowed each year. Time lost in excess of this amount must be made up by the student. The course of study follows the approved syllabus of The American College of Radiology and The American Society of Radiologic Technologists. The number of hours devoted to most subjects however, far exceed the basic minimum requirements. A registration fee of $25.00 is required upon entrance and is payable to the Treasurer, Duke University, on the day of entrance. Books and supplies are about $100.00. No living quarters are provided for para-medical students by the University. Students live in town at their own expense. At the

end of six months, if the student's work has been unsatisfactory or shows inaptitude for technical work in radiologic technology, he is advised to withdraw from the course. For further information write: John B. Cahoon, R.T., Technical Director, School of Radiologic Technology, Duke University Medical Center, Durham, North Carolina.

PROSTHETIC AND ORTHOPAEDIC APPLIANCES

The function of this department is to produce prosthesis and orthopaedic appliances for the medical profession. Facilities for individual training in specific techniques or methods employed by this department are available. Those who complete four years' training are eligible to take the examination of American Board of Certification.

THE SCHOOL OF NURSING

Fall semester begins September 23, 1965

Spring semester begins February 3, 1966

General Information

The School of Nursing functions within the philosophy of Duke University. This philosophy is epitomized by its motto, *Eruditio et Religio,* which "reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation and the church. Through changing generations of students, the objective has been to encourage each individual to achieve to the extent of his capacities an understanding and appreciation of the world in which he lives, his relationship to it, his opportunities, and his responsibilities."

The faculty of the School of Nursing ascribes to the concept that a professional nurse is a person who has acquired the specialized knowledge of Nursing, who has attained abilities useful in practice of Nursing, and who has developed attitudes appropriate to the profession of Nursing.

The faculty of the School of Nursing endeavors to promote a continuous change in the behavior of the students through experiences planned for the acquisition of specific knowledges which include: knowledge of scientific principles basic to Nursing, and knowledge of the tools, techniques, and resources useful in the practice of Nursing, and knowledge of characteristics of the Health and Welfare Institutions.

The faculty of the School of Nursing endeavors to promote a continuous change in the behavior of the students through experiences planned for the attainment of skills which include: the ability to make decisions independently or as group participants, the ability to relate separate phases of patient care to a total plan of patient care, the ability to observe specifics, and to interpret observations for self and others; the ability to work harmoniously and positively with people in ramified and complex situations and organizations.

The faculty of the School of Nursing endeavors to promote a continuous change in the behavior of students through experiences planned for the development of desirable attitudes which include: a concern for personal enrichment, an appreciation of and respect for individuality, an awareness of their role as citizens, for contributing to their own development and to that of their community and profession.

History

The School of Nursing of Duke University was established in association with the School of Medicine and Duke Hospital. The first class of students was admitted in January 1931. In 1953, the School of Nursing was incorporated into the Division of Health Affairs in the University structure. When established, the three year curriculum leading to the Diploma in Nursing was planned to prepare young women to meet community nursing needs; students who completed two years of acceptable college work were awarded a Bachelor of Science degree in Nursing in addition to the Diploma in Nursing. Trends in nursing created a demand for a four year program leading to the degree of Bachelor of Science in Nursing, and in 1953, the University Board of Trustees approved such a program. The Master of Science in Nursing degree was authorized in 1956.

Graduates of Duke University School of Nursing have served their communities in North Carolina and in other states; they have participated in their professional organizations on a national, state and local level. During World War II graduates of this school staffed the 65th General Hospital, the Duke University Medical Unit.

Relationship to the University

As a part of the University community, the School of Nursing serves its students as the focus of a total educational experience that only a major university can provide. It shares the same campus with Trinity College, College of Engineering, the Graduate School of Arts and Sciences, the Divinity School and the Schools of Law, Medicine and Forestry, and Duke Medical Center. The facilities for library, laboratory and field work and the many activities—religious, intellectual, cultural and athletic—form part of the environment which contributes to the development of students in nursing. Thus, the student in nursing may enjoy simultaneously the broad facilities and challenges of a University and the life and atmosphere of a professional school.

Membership and Accreditation

Duke University, which incorporates the School of Nursing with all of the other schools of the University, is a member of the Association of American Colleges and is accredited by the Southern Association of Colleges and Secondary Schools.

The generic program leading to the degree Bachelor of Science

in Nursing is accredited by the National League for Nursing and the North Carolina Board of Nurse Registration and Nursing Education.

The School is a member of the Department of Baccalaureate and Higher Degree Programs of the National League for Nursing.

Facilities

The facilities for instruction include the facilities available in the undergraduate, professional, and graduate schools and colleges of Duke University and the clinical facilities of Duke Hospital, the North Carolina Cerebral Palsy Hospital and the Durham Health Department.

In a wing of Hanes House are located the administrative offices of the School of Nursing, a large classroom seating 100 persons and equipped with audio-visual aids; a small classroom seating 50 persons and equipped with a screen and movie projector, a nursing arts laboratory with equipment for nursing practice for sixteen students, and conference room.

A reference library of 6,000 books and periodicals of special interest to students majoring in nursing is located in Hanes House. Students use the general and professional libraries of the University.

Duke Hospital, an integral part of the Medical Center, is a 627-bed, 30 bassinet general hospital which performs the concurrent functions of patient care and professional education. It admits over 20,000 patients a year, and maintains comprehensive diagnostic and treatment facilities for their care.

Different levels of patient care are provided by a minimal care unit and intensive care facilities in addition to conventional nursing units. Private, semi-private, and ward accommodations are available. Approximate daily patient census by service is as follows: Surgery (including Urology, Otolaryngology, Ophthalmology, and Orthopaedics), 230; Medicine (including Dermatology and Neurology), 150; Pediatrics, 55; Psychiatry, 45; and Obstetrics-Gynecology, 45. Surgical facilities include 18 operating rooms and a recovery room; over 15,000 surgical procedures are performed annually. Two obstetrical delivery rooms are maintained.

Outpatient services include a public clinic which totals some 121,000 visits a year, a private diagnostic clinic of comparable size and an active emergency service. All of the hospital components are located within a single building. Close working relationships between Duke Hospital and outside health agencies contribute to continued care.

Duke Hospital is approved for internship and residency training by the Council on Medical Education and Hospitals of the American Medical Association, and conducts an active educational program

involving some 280 house staff members. The hospital is fully accredited by the Joint Commission on Accreditation of Hospitals.

The Summer Session

The programs in the School of Nursing include courses in the Summer Session each year. Students in the School of Nursing have their courses approved in the School of Nursing and pre-register with the Summer Session office. Students from other colleges and universities who are admitted to the School of Nursing with advanced standing may be required to enroll in the Summer Session to make up deficiencies. Arrangements for registration are made through the office of the Dean of the School of Nursing.

The Summer Session of 1965 will include two terms: Term I, June 12 to July 17; Term II, July 19 to August 24. By attending both terms it is possible for a student to earn as many as twelve semester hours of credit.

While the basic purpose of the Summer Session is to serve the academic and the professional requirements of those who are interested in their own educational advancement, the University recognizes the need of, and provides for, a varied recreation program both athletic and social.

University fees for Summer Session 1965 will be charged at the rate of $35.00 per semester hour for those admitted with advanced standing. Board for resident students is charged at the rate of $75.00 for each term of Summer Session, room is $46.50 per person for a term of Summer Session. The cost of laundry is approximately $.50 per week. A bill is sent to all pre-registered students to permit payment in advance.

Medical Care

Students enrolled in a regular program of studies are eligible for the services offered under the health program of the school.

Complete medical facilities are available to students at the Duke Medical Center under the health program. With the necessary exceptions noted below, this type of care is furnished at a minimum expense to regularly enrolled students. The cost is included in the general fee paid each semester.

1. Physical Examination: Upon admission each student receives a complete physical examination including a chest x-ray. Thereafter, the physical examination is repeated annually; the chest x-ray semiannually.

2. Health Office: The health office in Hanes House, under the di-

rection of a physician is maintained for the students in the school. Advice, treatment and examination are available to students during regular hours. Consultation with Duke Medical Center staff specialists are arranged through the health office if necessary; drugs, dressings, laboratory tests and x-rays are arranged for as needed.

3. Hospitalization: A student requiring hospitalization is admitted to Duke Hospital. Admission is arranged through the health office. Medical and surgical care is under the supervision of a senior physician or surgeon. Hospital care includes staff nursing, drugs, dressings, laboratory tests and x-rays as needed. Hospital care is limited to thirty days.

If the student is covered by an insurance plan which provides for hospitalization, medical or surgical benefits, the coverage shall be applied to the cost of her care.

4. Exceptions: The health program does not cover private duty nursing, refraction of eyes, treatment of teeth, all chronic or pre-existing conditions such as diseased tonsils, hernias, pilonidal cysts, chronic skin conditions, endocrine disturbances; elective surgery, braces or any orthopaedic appliances; accidents or illness occurring during vacations or while off the campus. Blood used for transfusions must be paid for or replaced.

5. Psychiatric Consultation: Advisory consultation with a psychiatrist can be arranged through the Dean of the School of Nursing at no expense to the student. Further psychotherapeutic interviews are not included in the program.

6. Student Health Insurance: This may be secured through the University at a minimal rate. The insurance excludes any coverage for accident or illness cared for under the health program; insurance protection is furnished for off the campus and during vacations.

Professional, Social and Cultural Organizations

The scope of student organized activities fall into many broad interest areas, such as student government, service, professional, and honorary, publications and radio, music, drama and social.

Three magazines and a comprehensive year book are published by students. Student publications are under the control of the Publications Board, composed of members from the University staff appointed by the President; men from the Junior and Senior classes, elected by the students in Trinity College and the College of Engineering; women from the Junior and Senior classes, elected by the students in the Woman's College; and women elected from the Junior and Senior classes, elected by the students in the School of Nursing; and editors and managers of student publications, *ex officio* members with-

out voting power. No student publication can be established at the University without the approval of the Board.

The musical groups include the Chapel Choir, Symphony Orchestra, Concert Band, Glee Clubs, and several smaller groups. The Duke Players present a number of plays and readings each season. The Hoof 'n' Horn Club annually produces a musical comedy which is usually written, cast, directed, and acted by students from the three colleges.

Other campus groups, social in nature, sponsor dances, chaperoned cabin parties, concerts, and informal discussion groups. Social functions are frequent enough to afford the relaxation needed from work required in class room and laboratory.

The Union Building, located on the West Campus, is the student center for coeducational activities. It houses, among other groups, the Student Union organization. This body is unique in its coeducational aspects, bringing the men and women together in the carrying out of its stated purpose, "to stimulate, promote, and develop the social, recreational, cultural, educational, and spiritual activities of the students of Duke University." This purpose is carried out through a broad program including lectures, concerts, recreational activities, dances, exhibits, etc., adapted to the leisure time interests and needs of all students, who as undergraduate students are members of the Union.

Religious Life

"Eruditio et Religio," the motto emblazoned on the seal of the University, proclaims belief in the essential union of knowledge and religion in the educational process. The Gothic Chapel stands at the center of the campus, an inspiring symbol of the place of religion in the well-balanced life. The Chapel program encourages the cultivation of the moral and spiritual life of students.

Opportunities are provided through the Chapel and its related activities to translate worship into effective Christian living. Denominational, interdenominational, and interfaith loyalties are emphasized. Protestant, Roman Catholic, and Jewish students are organized in their respective groups, each having a denominational chaplain or adviser.

The University Religious Council, composed of students and faculty, promotes the interdenominational religious life in its many facets. The work of the Council and of the denominational program is under the supervision of the Chaplain to the University, who is also Director of Religious Life. He, with two Associate Directors of Religious Life and five denominational chaplains, coordinates the

religious program of the campus. They also offer personal guidance and spiritual counsel to all students in matters related to their faith.

The Dean of the Chapel is a key figure in student religious life. A regular preacher to the University, he preaches in the Chapel each month. He serves as an officiating minister and participates in the planning of the University's religious program.

Additional opportunities for the enrichment of the student's religious life are offered in organ and carillon recitals, choral concerts, other special services held from time to time, and in the sermons of distinguished guest preachers from many lands who are heard in the Duke Chapel. Some students, at their own discretion, participate actively in the programs of the downtown churches of their choice.

Student Government Association

The purpose of this organization is to regulate all matters pertaining to the life of the undergraduate women of Duke University School of Nursing not under the jurisdiction of the faculty; to increase a sense of individual responsibility; and to cooperate with the faculty in creating and maintaining high ideals for the Duke University School of Nursing. Each student is a member of this Association from the time of her entrance into the School of Nursing until her graduation. An Executive Council, consisting of fifteen elected members, coordinates the affairs of this Association, and with the student body is responsible for legislative action.

THE HONOR SYSTEM: The purpose of the Honor System is to secure the cooperation of the undergraduate student body in maintaining honorable conduct in all relations of student, professional and social life. It applies to every undergraduate student in the School of Nursing. The Honor System is a vital directive force in all phases of each student's life and is a major working part of the Student Government Association.

Santa Filomena

SANTA FILOMENA is a senior honorary society founded at Duke University School of Nursing. Its purpose is to recognize achievement and promote leadership. New members are publicly tapped at the May meeting of Student Government Association. They are selected from the rising Senior class and must fulfill the following three requirements:

1. Maintain a superior average throughout their first two years.
2. Demonstrate superior nursing ability.

3. Make some contribution to the betterment of the School of Nursing.

Santa Filomena strives to serve the nursing profession. Because all proceedings and ceremonies except tapping are secret, this honorary society can perform many varied service activities.

Santa Filomena's color is white; its flower, a white carnation; its pin, a small gold Florence Nightingale lamp.

The North Carolina State Student Nurses Association

As members of the Duke University School of Nursing, students are members of the North Carolina State Student Nurses' Association and the National Student Nurses' Association, such membership facilitating social relationships and an interchange of ideas with the students of various programs of nursing education throughout the state and nation.

Undergraduate Program of Study

Admission Requirements

NEW students are admitted for the academic year at the opening of school in the fall.

Candidates may qualify for admission as members of the freshman class or as students with advanced standing. Since the enrollment is limited, the Committee on Admissions selects students who, in its judgment, are best qualified to benefit from the educational advantages which the school offers. Selection is based on the academic record of the candidate, on test scores, and on satisfactory evidence of good character and general fitness for college life at Duke. A visit to the campus for a personal interview with members of the faculty is of material benefit to the candidate and to the Committee.

ADMISSION TO THE FRESHMAN CLASS: A candidate for admission to the freshman class must present at least fifteen acceptable units of secondary school credit. A minimum of twelve units must be in college preparatory subjects, but it is recommended that fifteen be offered. Subjects classified as college preparatory are English, foreign language, history and social studies, mathematics (Algebra and Geometry), and sciences.

Students applying for admission are required to take the Scholastic Aptitude Test, the English Composition test, and two other achievement tests of their own choosing given by the College Entrance Examination Board.

Prospective students are urged to broaden their reading outside of class during their senior year and to make the acquaintance of books and magazines that do not form part of the subject matter of their courses. At the same time, they should take every opportunity to increase their competence in writing. Those who cannot write simple, clear, grammatical English prose will be progressively at a serious disadvantage in the competition for admission and also in the general work of the Freshman year. Careful attention to correctness in English in correspondence and on application blanks cannot be too seriously stressed for candidates for admission.

EARLY DECISION PLAN: For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on December 1 of the student's senior year in secondary school. The deadline date for completing

applications for December decision is November 1. Interested students should write to the Office of Admissions for detailed information.

REGULAR ADMISSION: Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group, decisions are mailed by April 15.

Candidates for admission to the School of Nursing should address their inquiries to the Office of Admissions, Duke University, Durham, N. C., 27706.

A candidate for admission who wishes to arrange an interview should do so through the Office of Admissions.

Specific Requirements for Admission

I. All applicants for admission to the School of Nursing must present at least fifteen acceptable units of secondary school credit. A unit of credit is allowed for a course of study pursued throughout an academic year at an accredited secondary school, if the course has been completed satisfactorily.

1. Twelve units must be in English, foreign language, history and social studies, mathematics, and natural science; and must include:
   (a) English—3 units.
   (b) Algebra—1 unit.
   (c) Plane geometry—1 unit.
   (d) Chemistry—1 unit.
2. The three remaining units are elective and may be selected from those subjects for which the school allows credit toward graduations; but they should also be selected from the five subject fields listed above.

Other units offered in subjects not included in this list will be considered for acceptance on the basis of full statements transmitted with the applicant's record from the school recommending her.

II. Applicants are advised to have their scores on the Scholastic Aptitude Tests and the scores on three achievement tests of the College Entrance Examination Board submitted to the office of Admissions of the School of Nursing.

III. All applicants must supply references from at least three persons, two of whom must be recent high school or college instructors.

Graduate nurse applicants should submit one reference from a faculty member of the School of Nursing from which they were graduated and if applicable, from an employer.

IV. Interviews with members of the Duke University School of Nursing faculty are desirable and are encouraged.

V. Evidence of good health will be requested after the applicant is considered for acceptance. Final acceptance will be contingent on a complete physical examination during the week of Orientation. This examination also includes a chest x-ray, blood and urine studies and skin tests.

Admission to Advanced Standing

Admission by transfer from other institutions may be arranged for a limited number of students, under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal, and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students may not apply for transfer beyond admission to the junior class. Further detailed regulations for admission by transfer may be obtained from the Office of Admissions.

Applicants for advanced standing in the School of Nursing should present, as far as possible, subjects corresponding to those required by the School. They may not, during their first semester, register for more than the minimum number of hours required of the class which they enter, except by permission of the Dean of the School of Nursing.

Graduate nurses applying for admission to advanced standing are required to submit records of previous performance in Nursing, scores on the Scholastic Aptitude Tests and three Achievement Tests.

TRANSFER CREDITS. Transfer credit, in which grades of C or above have been earned, is rated at two quality points per semester hour. Courses in which grades of less than C have been earned are not acceptable for credit.

Although credit for work completed at other institutions will be determined in relation to the curriculum requirements of the School of Nursing, an overall average grade of C on all previous work taken is required before consideration for advanced standing may be given.

A student who transfers with advanced standing to the School of Nursing from a junior college must be enrolled for at least one semester before transfer of credit will be accepted. Credit for courses in science offered for advanced standing by a transfer from a junior college will be determined by the departments concerned.

The maximum amount of credit acceptable from a junior college is 60 semester hours, exclusive of physical education. No credit is given for work completed by correspondence, and credit for no more than six semester hours is allowed for extension courses. Any extension work accepted must be approved by the dean.

SPECIAL STUDENTS: Graduate nurses may be admitted for special work in such courses of instruction as their earlier training and experience may qualify them to take. They may not be admitted as candidates for a degree in the regular course of study unless they are able to meet all normal requirements for admission, which apply to all beginning students.

READMISSION OF FORMER STUDENTS: Former students who have for various reasons withdrawn from college and who wish to continue their collegiate careers should apply to the Duke University Office of Admissions with a detailed account of their activities since withdrawal from college.

Financial Information and Living Accommodations for Undergraduate Students

FEES PAID by students cover only a part of the cost of their instruction and of the operation of the University. Income from endowment and contributions from the alumni, alumnae, and other public spirited men and women meet the balance, which constitutes more than half the total cost.

Estimated Expenses

	1st year (2 sems)	2nd year (2 sems)	3rd year (2 sems)	4th year (2 sems)	Summer Sessions§
Tuition	$1250.00	$1250.00	$1250.00	$1250.00	
General Fee	187.00	187.00	187.00	187.00	
Room Rent	285.00	285.00	285.00	285.00	$ 46.50-$ 93.00
Board	450.00	450.00	*	*	75.00- 150.00
Laundry (approx.)	20.00	20.00	20.00	20.00	3.00- 6.00
Books (approx.)	40.00	40.00	40.00	10.00	10.00- 20.00
Activities (Student Government)	15.00	15.00	15.00	15.00	
Uniforms (approx.)	36.00	51.00			
Room Key Deposit	1.00				
Travel				15.00	
Locker Rental		1.00	1.00	1.00	
	$2284.00	$2299.00	$1798.00	$1783.00	$134.50-$269.00

* No board charges will be made for Junior and Senior students beginning September 1965. These students will pay for meals on a "pay by the meal" basis. Board costs may be estimated at $60 per month.

§ Charges for Summer term for each of first three years.

The tuition of $625.00 and the general fee of $93.50 are due and payable not later than the date of the beginning of a particular semester. No refund of the tuition or the general fee will be made except for involuntary withdrawal to enter the armed services.

Beginning the third year, qualified students may secure additional supervised training by performing services during hospital assignments in patient care. Such students receive awards commensurate with service performed.

New students, on notification of acceptance, are required to pay a non-refundable matriculation fee of $20.00 and to make a deposit of $50.00. The $50.00 deposit will not be refunded to accepted ap-

plicants who fail to matriculate. For those who do matriculate, $25.00 of the deposit serves as a continuing room deposit for successive semesters, and the remaining $25.00 as a continuing registration deposit. Arrangements for refund for $25.00 room deposit are described in information furnished each resident student by the Director of Housing. The $25.00 registration deposit will be refunded to students (1) whom the University does not permit to return, (2) who graduate, or (3) who request the refund at the time of pre-registration, thus indicating their intention not to return for the following semester. The registration deposit will not be refunded to students who pre-register and fail to enter the following semester on schedule.

Students who have been re-admitted to the University after an absence of one or more terms on notification of re-admission, are required to make the $50.00 room rent and registration deposit.

Undergraduate students are required to live in the School of Nursing residence houses unless they are married or are living with parents or relatives. Any exception must be approved by the Dean. Rooms are rented for a period of not less than one semester. No refund of room rent will be made to a student who withdraws from the residence halls.

The dining facilities available to students in the School of Nursing include the Medical Center and West Campus Cafeterias for upperclass students; the Hospital and Graduate Center Cafeterias and the East Campus Union for freshman and sophomore students. Sophomore and freshman students may not board at other than the places specified. The charge for board is payable, not later than the date of the beginning of each semester, also at the beginning of summer session. Students will not be entitled to a refund on board after the dates of the Fall or Spring mid-semester. (See Calendar.) Junior and senior students will not be required to pay Board fees beginning in September 1965. These students may purchase meals at any of the dining facilities located on West campus.

Part time special students who register for no more than two courses with a maximum total credit of eight semester hours are charged a registration fee of $5.00 for each course and $42.00 for each semester hour. Registration for 9 or more semester hours or 3 or more courses, requires payment of full fees.

Auditing of one or more courses without charge is allowed students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for not less than 3 nor more than 8 semester hours may audit other courses by payment of $21.00 for each course audited. Auditors submit no daily work, take no examinations, and receive no credit for courses audited.

One transcript is issued free of charge. Additional copies are supplied at $1.00 each.

No records are released and no student is considered by the faculty as a candidate for graduation until she has settled with the Treasurer for all indebtedness.

Bills may be sent to parents or guardians provided the Treasurer has been requested in writing to do so. Failure to pay bills on or before the due dates will debar the student from class attendance until the account is settled in full.

Living Accommodations

Hanes House and Hanes House Annex are residence houses for School of Nursing students. A counselor and her assistants, who are members of the Dean's staff, live in the respective houses. The counselors, with the cooperation of the Student Government Executive Council, are responsible for the administration of the houses.

Undergraduate students are required to live in the residence houses unless they are married or are living with parents or relatives. Any exception must be approved by the Dean. Rooms are rented for the academic or calendar year, but for a period of not less than one semester. No refund of room rent will be made except for involuntary withdrawal to enter the armed services. Such refunds will be made in accordance with the University's established schedule.

The rental charge for a single room is $335.00 for an academic year or $167.50 per semester or $465.00 per twelve month period. The rental charge for a double room is $570.00 for an academic year or $142.50 per person per semester, or $790.00 per twelve month period or $395.00 per person for twelve months period. The rental charge for a single room for a summer session term is $55.50; the rental charge for a double room for a summer session term is $93.00 or $46.50 per person.

Regulations governing the occupancy of rooms will be supplied by the Director of Housing to those students making application for housing. Occupants are expected to abide by these regulations.

Room reservations are made with the Director of Housing. An applicant who has been officially accepted as a resident student is assigned a room according to an established plan. The initial $25.00 room deposit is effective for the entire college course of the student whose attendance during regular terms is continuous. The deposit will be refunded to resident students under the following conditions: (a) within thirty (30) days after the student has been graduated, (b) upon student's withdrawal from the University residence halls provided a written notice is received by the Director of Housing by August 1 for cancellation of reservation for the fall semester and not later than January 15 for cancellation of reservation for the spring semester, (c) when the reasons requiring withdrawal are beyond the student's con-

trol. No refund is made until the occupant has checked out of her room through the Housing Bureau and has settled all her accounts with the Bursar.

The Director of Housing with the assistance of the Orientation Committee selects a roommate for a new student who is assigned to a double room but has made no arrangement for a roommate. After a student has been in residence for one semester, she is responsible for obtaining and keeping a roommate if she continues to occupy a double room. If a student occupying a double room does not obtain a roommate within a period of seven (7) days after written notice has been sent from the Director of Housing, she may be required to pay the rental consideration for the whole room.

After a student has engaged a room she is not permitted to move to another without the consent of the Director of Housing. A student leaving one room and occupying another without permission may be charged for both rooms for the entire semester. No student is allowed to rent or sublet her room to another occupant.

Residence hall rooms are reserved by upperclass students in accordance with the plan that is published during the school year. All rooms that have not been reserved on or before the announced date will be considered vacant for the succeeding semester and will be assigned to others.

The rooms are equipped with only the principal articles of furniture. Each student provides her own linens, blankets, bedspreads, and curtains. She may supply additional articles, but large rugs and additional furniture which make cleaning difficult are prohibited.

Scholarships, Loans, Grants-in-Aid

SCHOLARSHIPS: Scholarships intended to recognize outstanding students are awarded annually to candidates who evidence qualities which give high promise of excellence in Nursing.

Candidates for competitive scholarship prizes should initiate applications during the fall semester of the senior year of study in secondary school. Instructions concerning the specific requirements and deadline dates will accompany the application materials sent to applicants for these awards.

All candidates for scholarships are required to take the Scholastic Aptitude Test and three Achievement Tests; English Composition is required as one of the three Achievement Tests of the College Entrance Examination Board in order to qualify for consideration by the Scholarship Committee. The test must be taken either in December or January prior to the September in which admission is sought.

AWARDS: A maximum of eleven scholarships will be awarded annually without reference to geographical area.

ELIGIBILITY: A student must be accepted for enrollment to the freshman class of the Duke University School of Nursing in the ensuing academic year to be eligible for consideration for a scholarship award.

OBJECTIVE: These awards are scholarships based on merit. They are intended to encourage young women who give promise of becoming leaders in the field of nursing. Financial need is not a factor in making the awards. The size of the stipend assigned to each winner, however, will vary to some extent with the financial circumstances of the recipient. The honorary stipend for students needing no assistance will be $200.00 annually, while the stipend may be as large as $1200.00 for the students who need maximum aid.

BASIS OF AWARDS: The Scholarships will be awarded on the following basis:

1. Secondary school scholastic record (candidates will be restricted to the highest quarter of their classes).
2. College aptitude as shown by tests, particularly the Scholastic Aptitude Test and the Achievement Tests of the College Entrance Examination Board.
3. Breadth of interests and native ability as indicated by extracurricular activities.
4. Participation in church, civic, and other organizations with particular reference to the demonstration of qualities of leadership.

DURATION OF AWARD: The award will be made for one year renewable for a second year on the condition that the holder maintain a scholastic average in the top quarter of her class or a "B" average, and further that she show evidence of developing the qualities of leadership which served as the basis for the original selection. The maximum duration of the award will be two years.

METHOD OF SELECTION: A scholarship Committee of Duke University faculty members will select the winners and alternates on the basis of the applications submitted. All applicants for scholarship will be notified of their eligibility for competition by March 15, 1965.

PROCEDURE: All candidates for Duke University School of Nursing Scholarships and grants-in-aid who wish to be considered for awards on the basis of their financial circumstances are required to complete the Parents' Confidential Statement of the college scholarship service. This statement may ordinarily be obtained from the high school guidance counselor or principal. Application for scholarship must be submitted by January 1 to the Office of Admissions, Duke University School of Nursing, Durham, North Carolina.

GRANTS-IN-AID: Although sufficient funds are not available to assist all applicants who present requests for aid, a number of grants-in-aid are made each year to able students who need financial assistance in order to meet the cost of attending college. Any candidate for admission, therefore, who considers herself to be in such need is eligible to apply for a grants-in-aid.

Applicants for grants-in-aid will be required to submit a detailed statement of financial resources.

The following scholarship fund is available to nursing students who apply for grants-in-aid.

FLORENCE K. WILSON SCHOLARSHIP FUND: Established in 1961 by combining the Nurses' Alumnae Association Scholarship Fund, the students' Florence K. Wilson Scholarship Fund and contributions from the Wilson family and friends; the income to be used for scholarships for students enrolled in the School of Nursing.

REMISSIONS OF TUITION: Certain students attending Duke University are entitled to a remission of the University tuition charge. Students in this group are entitled to a maximum of eight semesters of free tuition at the undergraduate level. Each Summer Session in which work is taken and each semester spent in another institution will be counted as one of the eight allowable semesters. Only those students enrolled in the regular Nursing School program leading to a Bachelor of Science degree in Nursing are entitled to a remission of tuition charge.

Children of ministers who are members of the North Carolina or Western North Carolina Conferences of the Methodist Church are entitled to a remission of the University Tuition charge, as are the children of ministers of all faiths residing in Durham County, North Carolina. This consideration is given only to children of resident members of the two North Carolina conferences who are giving their full time to religious work.

TUITION GRANTS: Tuition grants are given to the children, step-children, and adopted children of certain qualified staff members of Duke University.

LOANS: Since the attainment of college education, like the purchase of a home, is an expensive undertaking students may find it necessary to borrow a portion of the funds required. Duke University has student loan funds available which supplement the program of scholarships and grants-in-aid. All candidates for loans must make a minimum grade of "C" in the semester preceding their application for a loan. Freshmen, therefore, will ordinarily be recommended by the University Scholarship Committee for a student loan which will not exceed the amount of tuition for the second semester.

Loans are granted from the Joseph F. Stein Student Loan Fund by the University Loan Committee upon the recommendation of the Dean of the School of Nursing. This fund was established to provide a means of assistance to students to meet pressing financial problems. The amounts to be loaned are limited in size and will not be charged interest rates if paid prior to termination of the program or if the student completes her program. Should a student, with an outstanding loan, withdraw from the school before she has completed her program, interest will accrue at 3% per annum for the first five years; 6% per annum after 3% ceases to be effective. Monthly payments shall be made on the first day of the next following October and continuing on the first day of each month thereafter of at least two per cent of the amount of the principal balance on the June 30th next prior to the date on which the first such monthly payment becomes due.

Army and Navy Nurse Corps Student Program

Students in the Basic Nursing Programs may apply for appointments in the Army Student Nurse Program at the beginning of their Junior year, or the Navy Nurse Corps Candidate Program at the beginning of their Senior year. The appointments carry generous financial allowance. A student who participates twelve months or less serves on active duty in the respective service for 24 months. If 2 years support has been given, she serves 36 months.

Graduate Nurse Students enrolled in the Undergraduate Program may apply for the same appointment in the Army Student Nurse Program if they have completed their diploma program within the past 30 months and are able to complete the requirements for their degree within 24 months.

These opportunities are open only to students enrolled in programs accredited by the National League for Nursing.

Psychiatric Nursing Undergraduate Training Grant Awards

A limited number of Psychiatric Nursing Undergraduate Training Grant Awards are available to qualified Junior and Senior students.

An award provides for an annual stipend plus tuition fees.

Additional information about the Psychiatric Nursing Undergraduate Training Grant Awards may be secured in the Dean's office.

To qualify for an award, the student must have an above average academic record and the potential for admission to graduate study, and must declare intent to pursue a career in the field of Mental Health.

General Regulations
Undergraduate Students

Orientation Program

ALL FRESHMEN and transfer students are required to participate in the activities of Orientation Week. The program includes placement tests, orientation lectures, physical examinations, social events, special religious services, registration, and enrollment. New students who miss the whole or a part of the Orientation Program place themselves at a serious disadvantage at the very outset of their college career.

Registration

Students who register in either semester at a date later than that prescribed must pay to the Treasurer a fee of $5.00. Changes in courses for reasons not arising within the University require a payment of $1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

Health Regulations

Before admission to the School of Nursing, a student is required to have a physical examination by the family physician and to be immunized against typhoid fever, diphtheria, tetanus, smallpox and poliomyelitis. Physical defects, such as defective vision, dental needs, etc., must be corrected before admission.

Before final acceptance, each student is required to undergo a physical examination under the School's direction during Orientation. Students whose condition needs further observation may be admitted tentatively, but must cancel their applications if findings prove them physically unable to pursue the program.

General Academic Regulations

QUANTITY CREDIT AND COURSE LOAD: The term of credit used is the semester hour which signifies one class period a week

throughout the semester. Two or four hours of laboratory work are equivalent to one hour of class work. Two semesters of seventeen weeks each or three quarters of twelve weeks each constitute the academic year. For the degree of Bachelor of Science in Nursing, credit for 135 semester hours is required.

The normal load of a student is four or five academic and professional courses totaling 15 to 19 semester hours per semester during the freshman and sophomore year or 6 to 9 semester hours per quarter during the junior and senior years, exclusive of physical education. No student is permitted to take less than 14 semester hours of work per semester during the freshman and sophomore years or 6 semester hours per quarter during the junior and senior years or more than the normal load during any part of her program without special permission from the dean.

QUALITY CREDIT: The requirements for the degree are computed in semester hours and in quality points. Quality points are determined by grades as follows: for an A, four quality points for each semester hour; for a B, three quality points for each semester hour; for a C, two quality points for each semester hour; for a D, one quality point for each semester hour; for an F, no quality points. Credit for at least 270 quality points is required for the degree of Bachelor of Science in Nursing.

REQUIREMENTS FOR CONTINUATION IN COLLEGE AND FOR GRADUATION FROM COLLEGE: To continue in college and to graduate, students must, in addition to the requirements listed elsewhere in this Bulletin, pass a minimum number of semester hours, achieve a specified quality point ratio, and in the case of graduation earn a minimum number of quality points. The quality point ratio is calculated by dividing the accumulated number of quality points earned by the accumulated number of semester hours carried (not semester hours passed). These requirements are listed in the following table.

For continuation from	The minimum requirement is
The first to the second year	24 s.h. credit and a q.p.r. of 1.30
The second to the third year	56 s.h. credit and a q.p.r. of 1.60
The third to the fourth year	80 s.h. credit and a q.p.r. of 1.75
The fourth to the fifth year, if needed	114 s.h. credit and a q.p.r. of 1.85

For graduation the minimum requirement is 135 semester hours, 270 quality points and a quality point ratio of 1.9.

In addition to the qualitative standards listed above students must pass a minimum number of hours each semester. Freshmen must pass at least 6 semester hours of work in their first semester and 18 semester

hours in their first year exclusive of physical education; all other students must pass at least 9 semester hours each semester. Junior and senior students are expected to maintain a "C average" in nursing. The University may require a student whose record is considered unsatisfactory to withdraw, although the minimum requirements set forth in this paragraph have been met. Any student whose standing in the School of Nursing indicates that she is performing below an acceptable level (minimum requirements) in either her academic or clinical courses, will be (after careful evaluation by the faculty) placed on probation. Both the student and her parents will be appropriately notified of this action.

Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, reports on freshmen are mailed at each mid-semester period.

CLASS STANDING: Students to rank as sophomores must have to their credit at least 26 semester hours and 52 quality points; and must have passed certain designated courses relating to their major; as juniors, at least 56 semester hours and 112 quality points and must have passed those courses relating to and including the nursing major; and as seniors, at least 90 semester hours and a quality point ratio of 1.75 and must have passed those courses relating to and including the nursing major.

Academic Honors

DEAN'S LIST: In recognition of academic achievement, students who earn an average quality point ratio of 3.0 or higher on a semester's work of not less than the minimum academic load are placed on the Dean's list.

CLASS SCHOLARS: A student in each class of the School of Nursing who achieves the highest quality point ratio on at least a normal course load for each academic year shall be designated a Class Scholar.

CLASS HONORS: To be eligible for Class Honors a student must earn, during the year, credit for at least the minimum academic load permitted by the college in which he is registered. All semester hours on which a student receives a grade are counted in the determination of Class Honors. Students in the freshman, sophomore and junior classes who earn a 3.50 quality point ratio are eligible for Class Honors.

GRADUATION HONORS: To be eligible for consideration for Graduation Honors at graduation a student must have completed in residence a minimum of ninety semester hours. Students who earn an average of at least a quality point ratio of 3.50 are recommended for

a degree magna cum laude. Those who earn a quality point ratio of 3.75 are recommended for a degree summa cum laude.

Awards to Undergraduate Students

DUKE UNIVERSITY SCHOOL OF NURSING ALUMNAE AWARD: The Duke University School of Nursing Alumnae Award is presented to a graduating student by the Alumnae Association for leadership, scholarship and nursing skill.

THE MOSELEY AWARD: The Moseley Award of $25.00 is given to the student in the senior class who has shown the most skill in Nursing Arts throughout her program in the School of Nursing.

RESIDENCE REQUIREMENTS

The final two years of senior-level work in the School must be earned in residence. Students who meet this requirement but who still lack 6 or 8 semester hours in final fulfillment of requirements may take this work in another institution of approved standing, provided the course is approved by the head of the department concerned and by the Dean.

Students who complete in a summer session the work required by the University for the degree will be granted the degree at the end of the summer.

GRADING AND EXAMINATIONS

Grading: Grades are reported to indicate the following:

(1) Passed. A, B, C, and D are all passing grades. The letters are intended to indicate the following quality of work. A, exceptional; B, superior; C, average; D, low pass.

(2) Failed. A grade of F indicates that the student has failed the course, and in order to receive credit for the course she must repeat the work in class.

(3) Incomplete work. If because of illness or other emergency a student's work in a course is incomplete, she may receive an I for the course instead of a final grade. Incomplete courses must be completed before the close of the succeeding semester; otherwise the I is converted to an F and the course must be repeated in class if the student is to receive credit for it. In case a student whose work is incomplete is also absent from a final examination, she receives an X for the course.

(4) Withdrawal. The letter W is used to indicate official withdrawal from a course. If a student drops a course without permission from the Dean, the grade for that course is recorded as F. If she drops with permission a course in which she is failing, the grade for that course is

recorded as F unless, in the judgment of the Dean, circumstances do not justify this penalty.

REPORTS: Reports on proficiency in academic work are sent to parents or guardians after the examinations at the end of each semester. In addition, six-weeks advisory grade reports on freshmen are mailed each semester.

Class Attendance Regulations

General regulations for all students enrolled in nursing and nursing related courses.

(1) In all nursing courses, students may take a ratio of unexcused non-consecutive absences in the proportion of one absence per semester hour, no more than one third of which may be taken from laboratory hours. However, instructors may specify certain required classes and/or laboratories from which no unexcused absence may be taken; such absences would be considered as excessive, unexcused absences.

(2) Unexcused, consecutive absences, whether excessive or not, result in the loss of quality points as in the case of unexcused, excessive absences.

(3) When the student has incurred twelve absences, excused and unexcused, in any course she is required to drop the course unless the Dean and the instructor concerned grant special permission for her to continue in the course. (In a course of less than 3 s.h. a student may incur absences not to exceed ¼ of the class hour.)

(4) The first three tardies in a given course are counted as one absence. Thereafter, each additional tardy is counted as one additional absence.

(5) All absences taken immediately before and after announced holidays, holiday recesses, and/or vacation result in the loss of two quality points for each absence in each class.

(6) Each excessive or consecutive absence results in the loss of quality points as follows: one quality point for the first absence, two additional for the second, and three additional for the third. When the third unexcused, excessive or consecutive absence occurs, the student is debarred from the course with a loss of 6 quality points and an "F" in the course.

For Junior and Senior students with a grade average of 3.0:

Responsibility for punctual and regular class attendance is placed upon Junior and Senior students who, in a normal schedule earn grade average of 3.0 or above in the preceding term. They will be subject to no fixed absence limitations except for the specified re-

quired classes and for absences immediately before and after announced holidays, holiday recesses and/or vacations for which the usual consequences will apply. Instructors are expected to refer to the Dean for appropriate action, any student who in their opinion is causing her work or that of the class to suffer because of absences or tardies.

Regulations for all students enrolled in general courses:

A student is expected to attend class meeting regularly. Since, however, the University intends that the matter of class attendance shall be primarily the student's responsibility, no limitation of absences per course is prescribed. However, it should be recognized that one of the most vital aspects of a residential college experience is attendance and participation in the classroom, and that the value of this academic experience cannot be fully measured by testing procedures alone. Students are considered sufficiently mature to demonstrate the kind of self-discipline and personal responsibility required under the non-compulsory system. The student must recognize and accept the consequences, if unwilling or unable to live under such a system.

Other Regulations

CONDUCT AND DISCIPLINE: The University expects of its students loyal and hearty cooperation in developing and maintaining high standards of conduct as well as of scholarship. General University regulations concerning conduct of students will be made available to students when admission is offered, or under other circumstances, upon request. The student in accepting admission indicates a willingness to subscribe to those regulations. The University therefore reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory to the University, even though no specific charge may be made against the student.

General oversight of the conduct of students and the administering of discipline are under the supervision of the Vice-President in the Division of Student Life. Immediate supervision is entrusted to the Dean. However, through the expressed willingness of the students of the University to assume the responsibility of maintaining high standards of morals and honor, the student body has properly become to a great degree self-governing. The duly elected representatives of the student body, exercise the authority granted the students to investigate all cases of misconduct, as well as all other cases of violation of proper student standards and traditions, and to make recommendations of penalties based on their findings. They exert a guiding and

stimulating influence for the promotion of high ideals of conduct and of student relationships.

MOTOR VEHICLES: Freshmen are not advised to own or operate motor vehicles at the University. Members of the upper classes may operate motor vehicles, however, when in accordance with University regulations.

Each student possessing or maintaining a motor vehicle at Duke University shall register it annually at the beginning of the fall semester. If a student acquires a motor vehicle and maintains the same at Duke University after enrollment, he must immediately register it. Resident students are required to pay an annual parking fee of $30.00 for each automobile.

At the time of registration of a motor vehicle, the following documents must be presented:

(a) State vehicle registration certificate.

(b) Valid driver's license.

(c) Satisfactory evidence of automobile liability insurance coverage with limits of at least $5,000.00 per person and $10,000.00 per accident for personal injuries and $5,000.00 for property damage, as required by North Carolina Motor Vehicle Law.

(d) If the student is under 21, a statement signed by the student's parent or guardian granting the student permission to operate a motor vehicle at Duke University.

ENROLLMENT AND REGISTRATION: Students in residence are required to submit, not later than the date of the spring registration, cards showing their selection of courses for the following year. Evidence of the payment of the continuing preregistration deposit of $25.00 is required before the card may be submitted. These cards, approved by the dean, are filed for permanent record in the Central Records Office. Students who do not select their courses for the following year at the time appointed must be readmitted to the college by application to the Committee on Admissions. The same regulations, with the exception of the advance deposit, apply to registration for the spring semester.

Students who register in either semester at a date later than that prescribed must pay to the Treasurer a fee of $5.00. They are counted as absent in the work they have missed in the professional courses to which they are admitted, and these absences carry the same penalty as do other absences from the professional courses. Changes in courses for reasons not arising within the University require a payment of $1.00 for each change made. No course may be elected later than one week after the opening of the semester, and no student may be admitted to any class without an official enrollment.

FIRST AID COURSE

All students are advised to complete a Standard Red Cross First Aid Course before the date of enrollment in the School of Nursing. For those students who will find it impossible to complete such a course in their home communities, the local Red Cross Chapter will offer this course at the School of Nursing. Because of the heavy course load, the student will be at a disadvantage in planning to complete the course at the School of Nursing.

Requirements for Degree

BACHELOR OF SCIENCE IN NURSING

THE SCHOOL OF NURSING offers a program which is planned to cover a period of four years; four academic years and three summer terms. At the completion of this program, the student receives the degree of Bachelor of Science in Nursing and is then eligible for the examinations given by the North Carolina State Board of Nurse Examiners.

The School of Nursing offers to carefully selected persons a program based on experiences which are designed in sequential patterns to promote a concatenation of learning and growth. Classes are kept small and close contact with the instructor is encouraged. Whether in the classroom, hospital, laboratories, community, or in the extracurricular activities, the development of the student's physical, mental and social well-being is the primary consideration of the faculty.

Graduates of the program are prepared as professional nurses for beginning positions in nursing and have the competencies and theoretical preparation on which to build further knowledge.

To fulfill the requirements for the degree of Bachelor of Science in Nursing, a student must complete the program with a C average, must complete 135 semester hours as outlined below, earn 270 quality points, and show proficiency in the practice of nursing.

The requirements for the degree of Bachelor of Science in Nursing are based on the principle that the student will derive the maximum benefit if the program includes a broad distribution of studies among representative fields.

For graduation with the degree of Bachelor of Science in Nursing, the following course work or equivalent must be completed.

These requirements are described in detail below.

Uniform Course Requirements	s.h.
Natural and Biological Science	18-21
Social Sciences	24
English	6
Elective (Religion, Literature, Music, Art, or Philosophy)	12
Physical Education	2
Major (Nursing and related work)	68
Total	133

ENGLISH, 6 s.h.—This requirement is met by the completion of English 1-2.

NATURAL AND BIOLOGICAL SCIENCE, 20 s.h.—To satisfy this requirement a student must complete laboratory courses in Physiological Chemistry (3 s.h.),

Zoology, Botany, Chemistry or Physics (8 s.h.), Anatomy and Physiology (4 s.h.), and Microbiology (3 s.h.).

RELIGION, 6 s.h.—To meet this requirement 6 semester hours may be chosen from Religion 1-2, 51-52, 55, 65, 85, 93.

SOCIAL SCIENCE AND HISTORY, 24 s.h.—The following courses will satisfy this requirement: Education 118, Psychology 91 and 116; and Sociology 91, 92, and 150. The remaining 6 s.h. may be selected from History (students who do not present for entrance 2 acceptable units of History must select History), Political Science 11-12, or 61-62, or Economics 51-52.

LITERATURE, MUSIC, ART, AND PHILOSOPHY, 6 s.h.—This requirement can be satisfied by a total of 6 semester hours in courses in English or American literature, Greek literature, foreign literature courses, literature courses in translation, courses in aesthetics, art, music, and courses in Philosophy (except 48, 103, 104, 109).

PHYSICAL EDUCATION, 2 s.h.—In the School of Nursing, Physical Education is required during the first year and must be completed by the end of the first year.

MAJOR AND RELATED WORK, 68 s.h.—This requirement is met by completing courses in the School of Nursing in accordance with the regulations described.

To complete the requirements in the regular period (four years) of study, the work is planned as follows:

FIRST YEAR

English 1-2	English Composition	6 s.h.
History 1, 2 or Political Science 11-12	Modern History The American System of Government	6 s.h. 6 s.h.
Elective		6 s.h.
Nursing 1-2	Interpersonal Relations in Nursing	4 s.h.
Zoology 1-2	Animal Biology, General Zoology	8 s.h.
Microbiology 4	Microbiology	3 s.h.
Chemistry 50	Chemistry	3 s.h.
Psychology 91	Introductory Psychology	3 s.h.
Physical Education		2 s.h.
		41 s.h.

SECOND YEAR

Nursing 52	Human Anatomy and Physiology	4 s.h.
Chemistry 51	Physiological Chemistry	3 s.h.
Nursing 91-92	The Fundamentals of Nursing	13 s.h.
Sociology 91, 92	General Sociology	6 s.h.
Nutrition 53	Nutrition and Diet Therapy	3 s.h.
Education 118	Educational Psychology	3 s.h.
Elective		6 s.h.
		38 s.h.

THIRD YEAR

Nursing 120	Pediatric Nursing	6 s.h.
Nursing 130	Obstetric Nursing	6 s.h.
Nursing 141	Medical-Surgical Nursing Principles	5 s.h.
Nursing 142	Medical-Surgical Nursing Practicum	4 s.h.
Nursing 155	Social Forces and Community Health	3 s.h.
Sociology 150	The Family	3 s.h.
Psychology 116	Psychology of Adjustment	3 s.h.
Nursing 180	Public Health Sciences	3 s.h.
		33 s.h.

FOURTH YEAR

Nursing 160	Social Foundation of Nursing	3 s.h.
Nursing 170	Psychiatric Nursing	6 s.h.
Nursing 181	Public Health Nursing	6 s.h.
Nursing 190	Medical-Surgical Nursing	6 s.h.
		21 s.h.

Description of Courses

EDUCATION

118. EDUCATIONAL PSYCHOLOGY.—A study of psychology of learning; individual and social development; and psychology of adjustment, as related to problems of instruction and the processes of education. Prerequisite: Psychology 91. 3 s.h. THORNTON

ENGLISH

1-2. FRESHMAN COMPOSITION.—Training in composition through the writing of weekly expository themes. The theme subjects derive from assigned reading drawn from British and American literature of the 20th Century. English 1 takes up the Essay, the Short Story, and the Novel; English 2, the Play and the Poem. The student attends each week (1) a general lecture on the reading for the week; (2) a section meeting, where the instructor and a small group discuss problems of composition and literature; and (3) an individual conference in which the instructor reads and grades the weekly theme and makes special assignments according to the needs of the student. 6 s.h. STAFF

ENGLISH AND AMERICAN LITERATURE AND LANGUAGE

55, 56. REPRESENTATIVE BRITISH WRITERS.—The following works are studied in the first semester: Chaucer's Prologue to (*The Canterbury Tales*) and at least two tales, Shakespeare's (*I Henry IV*), (*Hamlet or King Lear*), and one other play, John Donne's poetry (selections), (*Milton's Paradise Lost*) (selections) and some of the shorter poems; in the second semester: novels by Fielding (*Joseph Andrews*), Dickens (*Great Expectations*), and Hardy (*The Mayor of Casterbridge*), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 6 s.h. (E & W) STAFF

57, 58. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works. The first semester will include Poe, Emerson or Thoreau, Hawthorne, Melville, Whitman, Dickinson, and Twain; the second will include James, Frost or Robinson, Crane or Dreiser, O'Neill, Faulkner, Hemingway, and others. 6 s.h. (E & W) STAFF

HISTORY

1, 2. MODERN HISTORY.—This course is an introduction to the study of modern history with special reference to the issues in the modern world. Topics selected for emphasis are: the contest between liberty and authority in the modern state; changing economic organization and theory—capitalism and the challenges to it; the problems of peace and war among the states; the changing faiths men live and die by. Beginning about 1500 with the rise of the European dynastic states, the story is pursued in the first semester to approximately 1848, and in the second through the two great world wars. The central theme in both semesters is the expansion of the influence of Western Europe throughout the world, with some attention to the rise of the United States as a world power. 6 s.h. (E & W)

Sophomores and juniors are not admitted to this course.

PROFESSOR ROPP AND STAFF

51, 52. MODERN HISTORY.—An introductory course for sophomores, juniors and seniors dealing with the topics indicated in the description of course 1, 2. 6 s.h.

PROFESSORS PARKER AND ROPP; ASSOCIATE PROFESSORS ACOMB, HOLLYDAY, W. SCOTT AND YOUNG; DR. GINTER; MR. CELL

51X, 52X. MODERN HISTORY.—A special section for seniors who have had no other history at Duke and who wish a course in history before completing their college career. The topics covered will be essentially the same as those indicated in the description of course 1, 2. 6 s.h. PROFESSOR ROPP

PHILOSOPHY

41, 42. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include, in Philosophy 41, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. In Philosophy 42 these include the nature and ground of values, ultimate goals and moral obligation. (Philosophy 42 may be taken before, or with, Philosophy 41.) 6 s.h. STAFF

POLITICAL SCIENCE

11-12. AMERICAN AND EUROPEAN POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. An introductory course for Freshmen dealing with the topics indicated in the description of Political Science 61-62. (Open only to Freshmen) 6 s.h. ASSOCIATE PROFESSOR HALL; ASSISTANT PROFESSORS CHEEK, FINLAY AND KEARNEY; MESSRS. MEEKISON AND ZIKMUND

61-62. AMERICAN AND COMPARATIVE POLITICAL SYSTEMS.—An introduction to the theory and practice of modern government. The first semester is devoted to the study of American constitutional democracy. Topics examined include federal-state relations, the separation and interrelationships of the executive, legislative, and judicial branches of government, judicial review, the role of political parties and public opinion, the formulation and execution of domestic and foreign policy, civil liberties. The second semester is devoted to a study of constitutional democracy in Great Britain and France with emphasis upon the similarities and differences between those systems and our own. Detailed attention is also given to an examination of the theory and practice of totalitarian dictatorship as exemplified in the U.S.S.R. 6 s.h. (E & W)

ASSOCIATE PROFESSORS LEACH AND SIMPSON; ASSISTANT PROFESSORS CHEEK, HOWARD, AND KEARNEY; MESSRS. MEEKISON, WASHBURN, AND ZIKMUND

REQUIRED PHYSICAL EDUCATION

Two semester hours, to be completed in two semesters, are included in the 135 hours required for graduation. Students may elect activities in sports or dance with the possibility of four different choices in the year's requirement.

At the beginning of the freshman year, each student is tested in posture, rhythm, sports fundamentals, and swimming. For those whose test scores are low, remedial courses in these basic skills are suggested. A swimming course is required for those who do not pass the elementary swimming test.

PROFESSOR MCCUE, CHAIRMAN: PROFESSORS BOOKHOUT AND LEWIS; ASSOCIATE PROFESSORS EDDY AND HOLTON; ASSISTANT PROFESSORS LLOYD, SPANGLER, WOODYARD, AND WRAY; MISS RAYNOR

PSYCHOLOGY

91. INTRODUCTORY PSYCHOLOGY.—An introduction to the facts, principles, and problems of normal adult psychology through a study of psychological methods as applied to motivation, emotions, perception, sensation, thinking, memory, learning, individual differences, and personality. 3 s.h. STAFF

116. PSYCHOLOGY OF ADJUSTMENT.—The course is planned to give an adequate understanding of problems of adjustment and of mental hygiene. Lectures and discussions cover an application of the principles and findings of normal and abnormal psychology as these relate to the adjustment of the average individual in our changing society; a survey of the principles of mental hygiene; discussions of current socio-cultural trends significant for individual adjustment.

Not open to students who have had Education 68 or Psychology 100. 3 s.h. (W) STAFF

RELIGION

The uniform course requirement in religion may be met in one of the following ways: (a) by completing, in the freshman year, Religion 1-2; (b) by completing, in the sophomore year or later, Religion 51-52; (c) by completing, in the sophomore year or later, Religion 55 and one other course selected from those numbered 60-99.

Students who have fulfilled the uniform course requirement in religion are eligible to elect any course numbered 100 or above, except those for which additional prerequisites are prescribed. Courses numbered below 100 may not be taken by those who have completed the uniform course requirement in religion.

1-2. THE ENGLISH BIBLE.—A comprehensive survey of the books of the Old and New Testaments. The literature is examined in the light of its origin in the history and religion of the people of the Bible, in order that its theological significance in its own day and in ours may be understood. Open only to freshmen. 6 s.h. Staff

51-52. THE ENGLISH BIBLE.—A survey of the Old and New Testaments, similar to Religion 1-2 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion 1-2. 6 s.h. Staff

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 3 s.h. Staff

65. JESUS: THE MAN AND HIS MESSAGE.—A detailed examination of the Gospel records, for the purpose of recovering the person and mission of Jesus. Attention will be given to conceptions of Christ in the history of the Church, and to his contemporary significance. Prerequisite: Religion 55. 3 s.h. Phillips

85. INTRODUCTION TO CHRISTIAN ETHICS.—A brief analysis of the Biblical and historical bases for the Christian understanding of man's moral situation, followed by a study of the social implications of Christianity in such areas of life as marriage, race, the political and economic order, etc. Consideration is given to the relation of Christian ethics to moral philosophy. Prerequisite: Religion 55. 3 s.h. McCollough

93. SURVEY OF THE WORLD'S LIVING RELIGIONS.—An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, several of the major living religions are dealt with in terms of historical development and the beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55. 3 s.h. Bradley, Partin, and Sullivan

SOCIOLOGY

91. INTRODUCTION TO SOCIOLOGY: CONCEPTS AND PROCEDURES.—Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. 3 s.h. Open to Freshmen. Staff

92. INTRODUCTION TO SOCIOLOGY: SOCIOLOGICAL STUDIES.—Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 3 s.h. Staff

150. THE FAMILY.—Analysis of the American family as an institutionalized group and its relationship with other institutions and structural features such as social class and ethnic group. Special attention is devoted to methods of research in this area. 3 s.h. Kerckhoff

ZOOLOGY

1. ANIMAL BIOLOGY.—The principles of biology as applied to animals. 4 s.h. Associate Professor Klopfer and Staff

2. GENERAL ZOOLOGY.—A survey of the animal kingdom. Prerequisite: Zoology 1. 4 s.h. Professor Bookhout; Associate Professor Hunter and Staff

HUMAN BIOLOGICAL AND PHYSICAL SCIENCE

N52. HUMAN ANATOMY AND PHYSIOLOGY.—A study of the normal structure and functions of the human body. 4 s.h.
PROFESSORS TOSTESON, MARKEE AND STAFF

Chem. 50. CHEMISTRY.—A course in the fundamentals of general inorganic chemistry with particular emphasis on introduction to organic chemistry. 3 s.h.
ASSOCIATE PROFESSOR THIERS

Chem. 51. PHYSIOLOGICAL CHEMISTRY.—This course is designed to aid the student in understanding the chemical mechanism of the human body both in health and in disease. The student also acquires knowledge concerning the chemical basis of diagnosis and therapy. 3 s.h. ASSOCIATE PROFESSOR THIERS

Micro. 4. MICROBIOLOGY.—A survey of the principles and techniques of microbiology and immunology with special emphasis on their applications to nursing. 3 s.h. DR. H. S. NIELSON, JR.

NURSING AND ALLIED ARTS

NI-2. INTERPERSONAL RELATIONS IN NURSING.—This is an introductory course which is designed to assist the student in further developing concepts and skills that are basic to competence in interpersonal relations and nursing therapy. The student begins to define and amplify her concepts of the role of the professional nurse. Content of the course is based on the belief that a conscious possession of interpersonal concepts and goal directed behavior is basic to professional management of nurse-patient situations. A limited number of supervised short interviews with in-patients is arranged. 4 s.h.
ASSISTANT PROFESSORS DUNHAM, CULVER, AND STAFF

Nutr. 53. NUTRITION AND DIET THERAPY.—This course considers the nutritional needs of individuals of varying ages and methods of meeting these needs under different economic and social conditions. Some accepted principles are presented on which dietary modifications are based, as are some practices based on these principles. 3 s.h. ASSOCIATE PROFESSOR MCLACHLAN AND STAFF

N91-92. THE FUNDAMENTALS OF NURSING.—A study of the fundamentals of patient care, aimed at giving the student a basic knowledge and understanding of the principles and skills of nursing care. The student has correlated experiences in patient care and has the opportunity to participate in patient-centered conferences. Both of these are designed to assist her in the process of integrating the concepts of the behavioral and the natural sciences in her approach to nursing care problems. Emphasis is placed upon developing therapeutic nurse-patient relationships. 13 s.h.
ASSISTANT PROFESSORS GOVER, AHLGREN; MISSES LAWRENCE, LESKO, NOLAN

N120. PEDIATRIC NURSING.—This course focuses on child care and the nurse-child-family relationship. This course is designed to help the student acquire knowledge, understanding and nursing skills which are necessary to assist in the promotion of comfort, health and safety of children. Laboratory experiences include observation and participation in the care of children in hospital and community. 6 s.h. ASSISTANT PROFESSOR HORTON; MISSES AGNER AND COLLINS

N130. OBSTETRIC NURSING.—This course focuses on the nursing needs of mothers and newborn infants. This course is designed to help the student acquire knowledge and to develop understanding and nursing skills necessary to assist in the promotion of comfort, health, and safety of the mother and newborn infant during the reproductive experience. 6 s.h.
ASSISTANT PROFESSORS HORTON AND HOGUE; MRS. PROCTOR

N141. MEDICAL-SURGICAL NURSING PRINCIPLES

N142. MEDICAL-SURGICAL NURSING PRACTICUM.—These courses are designed to assist the student in developing skills basic to identifying and meeting the nursing needs of patients with acute and chronic medical and surgical condi-

tions. Experiences are planned to increase the student's understanding of the need for continuity of nursing care and to enhance her ability to implement this as she cares for patients in various medical and surgical settings. These courses must be taken concurrently, and must be completed satisfactorily, to receive credit for either course. 5 s.h.: 4 s.h. Assistant Professors Harris, Crane and Steele
Misses Janoscrat and Lemmond

N155. SOCIAL FORCES AND COMMUNITY HEALTH.—Analysis of community action designed to alleviate universal health, welfare and educational problems. Demonstrate the concomitance of social, economic and cultural patterns with social legislation. Course is to be taken concurrently with N141-N142. 3 s.h. Assistant Professor Harris

N160. SOCIAL FOUNDATION OF NURSING.—A survey of major historical, philosophical, and sociological factors which have affected Nursing and Nursing Education. The purpose of the course is to give the student a better understanding of the place of nursing in present day society and the responsibilities of the individual nurse to society. 3 s.h. Professor Jacobansky
Assistant Professor Mordan

N170. PSYCHIATRIC NURSING.—This course focuses on dynamic psychiatric nursing. It is taught within the frame of reference of interpersonal theory, communication theory, problem solving process and dynamic psychiatry. It provides opportunities for learning under supervision through experiences in a one-to-one relationship with a hospitalized psychiatric patient. 6 s.h.
Assistant Professor Parks and Staff

N180. PUBLIC HEALTH SCIENCE.—This course offers a body of knowledge derived from the field of public health which includes an introduction to public health administration, environmental sanitation, bio-statistics and epidemiology. 3 s.h. Prerequisite to N181. Assistant Professor Campbell;
Visiting Lecturer

N181. PUBLIC HEALTH NURSING.—This course provides opportunities to develop the philosophies and to study the principles and processes of nursing in a public health setting, through classes and selected community nursing experiences with faculty guidance at the Durham County Health Department. 6 s.h.
Assistant Professors Campbell, Persing, Young
Mrs. Gaddy

N191. MEDICAL-SURGICAL NURSING.—The classes and clinical experiences are designed to consider the more complex nursing problems encountered in nursing care. Opportunities are also provided for the student to further develop her competencies in leadership skills and problem solving techniques. 6 s.h.
Associate Professor Fortune;
Assistant Professors Wilson, Caddell, Davenport

Graduate Program of Study*

General Regulations Governing

THE DEGREE of Master of Science is offered in the field of Medical and Surgical Nursing, Maternal and Infant Health, Pediatric Nursing and Psychiatric Nursing.

Admission

REQUIREMENTS FOR ADMISSION TO GRADUATE STUDY IN NURSING

1. Completion of an NLN accredited baccalaureate degree program in nursing which prepares for professional practice in all fields of nursing. (Provisional admission may be granted to applicants not fully meeting this requirement).
2. A record of undergraduate study that meets general standards for admission to graduate study at Duke University.
3. State registration for the practice of nursing.
4. Two recommendations from persons who are acquainted with the applicant's professional ability and capacity for graduate study.
5. NLN Graduate Nurse Examination scores will be requested prior to admission from applicants whose records are marginal.
6. Satisfactory health appraisal.
7. A personal interview may be required.

PROCEDURE FOR ALL APPLICANTS: Interested nurses should write to the Director of Graduate Studies, School of Nursing, Duke University, Durham, North Carolina. A brief biographical statement should be included in this letter. The nurse will be furnished an application form. In addition to the completed form the following supporting documents should be provided: (1) transcripts of all undergraduate and graduate work mailed directly by registrars; (2) two letters of recommendation written by persons qualified to judge the applicant's professional ability and capacity for graduate study; (3) a record of health appraisal; (4) evidence of registration to practice nursing; and (5) scores on qualifying examinations when requested.

DEADLINES FOR APPLICATIONS: The application and all supporting documents should be submitted to the Office of Admissions

* Not offered in 1965-1966.

not later than June 1 by those applying for the fall semester; before May 12 for admission to the first term of summer; and before June 18 for admission to the second term. It is the student's responsibility to make certain that her application is complete and in order before the dates specified. Students who are applying for Traineeship assistance are advised to assemble their credentials early in the calendar year in which they anticipate admission to graduate study.

NOTIFICATION AND STATUS: When the application is approved, the student will receive a letter of admission. The process of admission is not complete until a statement of acceptance has been returned by the applicant.

Applicants who are admitted will be offered either full admission or provisional admission. PROVISIONAL ADMISSION to one semester or a minimum of 12 hours of course work is offered to students who do not fully comply with admission requirements but appear to warrant admission. Graduate credit earned under *provisional status* may be applied toward an advanced degree at Duke University if and when upon review the student is granted full admission.

Registration

WHO MUST REGISTER. (1) All students who enter course work for credit; (2) all students who have completed minimum requirements for an advanced degree but continue to use the facilities of the University in their research.

REGISTRATION. After the applicant has received notification of admission and has submitted a statement of acceptance of admission, she is eligible for registration.

LATE REGISTRATION. All students are expected to register at the time stated. *Those registering later are subject to a late registration fee of five dollars.*

CHANGE OF REGISTRATION. During the academic year within a period of fourteen days from the specified day of registration, students may change their schedules with the approval of the Director of the Graduate Program.

Grades, Hours, and Credits

Although ideally graduate study is principally individual reading, research, and laboratory experimentation under guidance, academic progress in the United States is generally measured and recorded in terms of course hours and credits. Peculiar to graduate study is the term *residence,* also generally measured in hours, to designate indi-

vidual study apart from courses, such as writing a thesis and preparing for general examinations. Since September 1959 in this University, graduate credit for courses and seminars, research, and residence, and corresponding tuition and fees have been stated in terms of UNITS. According to conventional measurement ONE UNIT is equivalent to ONE SEMESTER HOUR. Thus a course previously described as carrying a credit of 3 s.h. now carries a credit of 3 units.

GRADES. Grades in the Graduate Program are as follows: *E, G, S, F,* and *I*. *E* (exceptional) is the highest mark. *G* (good) and *S* (satisfactory) are the remaining passing marks. *F* (failing) is below passing, and *I* (incomplete) indicates that some portion of the student's work is lacking, for a satisfactory reason, at the time the grades are reported. The instructor who gives an *I* for a course specifies the date by which the student must have made up the deficiency. In no case may an extension be granted beyond one calendar year from the date the course ended. If the course is not completed, a statement of *No Credit* is made upon the student's record.

COURSES PRIMARILY FOR UNDERGRADUATES. Students granted provisional admission may on occasion be required as part of their program to take undergraduate courses as prerequisites to continued graduate study. Undergraduate courses thus taken and others elected by the student will carry no graduate credit.

In exceptional cases, 100-level courses *outside the major department* may be taken for graduate credit to a maximum of two one-semester courses or one year-course not exceeding a total of 8 units, when approved by the Director of the Graduate Program in the major department and in the department in which the course is listed.

NORMAL PROGRAMS. Normally graduate students who do not carry teaching or assisting duties carry a full load of graduate work until the requirements of the degree are met.

WITHDRAWAL AND INTERRUPTION OF PROGRAM. *From a course.* After 14 days from the date of registration students may drop courses only with the approval of the Director of the Graduate Program, the instructor of the course to be dropped, and the Dean of the School of Nursing. If the course is dropped without the necessary approval, the permanent record will list the course as *Dropped Unofficially, F.* If a course is dropped 30 days or more after the beginning of the class for the semester involved, the status of the student at the time of withdrawal from the course will be determined and be indicated by the designation *Withdrew Passing* (W.P.) or *Withdrew Failing* (W.F).

From the School. The University reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct at any time is not satisfactory

to the University, even though no specific charge be made against the student. If a student wishes for any reason to withdraw from the School she should notify both the Director of the Graduate Program and the Dean of the School prior to the date of her expected withdrawal.

Students who find it necessary to interrupt their program of study for a period longer than a summer vacation should, before departure, provide in writing a statement of the reason for interruption, mailing address, and expected date of return.

TRANSCRIPT. A student who wishes to transfer his credits from Duke University to another institution is entitled to one free transcript of his record. A fee of one dollar, payable in advance, is charged for each additional copy. Requests are directed to the Records Office.

Financial Regulations

GENERAL FEES IN THE ACADEMIC YEAR. The following tables show the general fees and changes collected from all students. All fees for each semester are due and payable, unless otherwise specified, at the time of registration for that semester. No student is admitted to classes until arrangements have been made with the Treasurer of the University for the settlement of fees.

Tuition per semester	$525.00
General fee* per semester	93.50
Summer Session .....per unit	35.00

* General fees, in lieu of most special charges, include the following fees: Mathematics, Athletic, Medical, Library, Damage, Commencement, Diploma, and an average of the Laboratory and Materials fees. Expenses for field trips are not included.

Tuition and fees for a full semester program of 16 units amount to $618.50. For a part program in the regular semesters, tuition and fees are computed at the rate of $35.00 per unit plus $5.00 fee for each course. Tuition and fees for course work in the Summer Session are computed at the rate of $35.00 per unit. Federal traineeships are available for a selected number of qualified applicants.

WITHDRAWAL FROM A COURSE OR FROM THE GRADUATE PROGRAM. Arrangements made with the Treasurer to prorate tuition and fees due do not imply that the full amount is not due and payable. A student who after 14 days after the date of registration withdraws from a course or from the Graduate School is liable for payment of full tuition fees and room rent.

LIVING ACCOMMODATIONS. Graduate students in the School of Nursing may occupy rooms in the School of Nursing residence. The rental charge for a single room is $465.00 for the 12 month period. The rental charge for a double room is $395 for each occupant. Rooms

are rented for a period of not less than one semester unless special arrangements are made through the Housing Bureau after official acceptance for admission to the University. Students may arrange for apartments or rooms in private homes in the city. The Housing Bureau of the University maintains a file of rooms and apartments listed with it for rental. Students may use this file as an aid to locating suitable living accommodations.

DINING SERVICE. Food service on both the Woman's College Campus and the West Campus is cafeteria style. The cost of meals approximates $1.75 to $2.25 per day, depending upon the need and taste of the individual. The dining facilities on the West Campus include three cafeterias with multiple-choice menus, a grill, and, in addition, the Oak Room where full meals and a la carte items are served. The Men's Graduate Center has a cafeteria open at meal hours, and a coffee lounge which is open until 11:00 P.M. The prices are the same as in the West Campus Union. Because of the large number of those served in the dining halls, it is not possible to arrange special diets for individual students.

MEDICAL CARE. The complete medical facilities of the Duke University Medical Center are available to all members of the University community. To secure the benefits of the Student Health program, a graduate student during the term or semester in which the illness occurs must 1) in the Summer Session term be registered for at least 3 units. 2) prior to completing minimum residence requirements be registered for at least 9 units per semester. Students are not covered during vacations and their dependents and members of their family are not covered at any time. Care is provided at the Health Office in Hanes House.

The service provided includes hospitalization in Duke Hospital, when recommended by the Hospital staff, to a limit of thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Students pay for board while in the hospital. Excluded from the service are refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions, and elective surgery.

Graduate students are urged to carry adequate health insurance to supplement Student Health Program services. If students have insurance providing hospitalization, surgical, or medical benefits, the benefit shall be applied to the cost of their medical care.

MOTOR VEHICLES. Every motor vehicle operated on the campus by students enrolled in Duke University must be registered at 07 Allen Building within five days after arrival and thereafter must display the proper decal emblem. To register a vehicle, the student should present the following documents: (1) state vehicle registration,

(2) state operator's license, (3) evidence of automobile liability insurance as required by North Carolina law ($5,000 per person, $10,000 per accident for personal injuries; $5,000 for property damage).

STUDENT ACTIVITIES. Graduate students new to Duke University may be reminded that they are welcome to use such recreation facilities as swimming pools, tennis courts, golf course, and to affiliate with choral, drama, and religious groups. They may become junior members of the American Association of University Professors.

UNIVERSITY COUNSELING CENTER. The University maintains a Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. In addition, the Center administers special group testing programs for University schools and departments and serves as the local testing center for a wide variety of national testing programs. The Center also carries on programs of research in the field of measurement and counseling.

Master of Science in Nursing

Philosophy and Purpose of Graduate Education

AT Duke University, Graduate Study in Nursing operates within the organizational structure of the School of Nursing and derives its rights and responsibilities from the statutes of Duke University. It conducts its educational programs in accordance with policies which regulate the edcuational status of graduate students within this University. While the School of Nursing regulates its own educational affairs, the graduate faculty in nursing maintains a cooperative relationship with other faculties within the University and utilizes the educational resources of other graduate programs that are appropriate to its purposes.

Fundamental to Graduate Study in Nursing is the philosophy of Duke University as epitomized by its motto (*Eruditio et Religio*), which "reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation and the church. Through changing generations of students, the objective has been to encourage each individual to achieve to the extent of his capacities an understanding and appreciation of the world in which he lives, his relationship to it, his opportunities and his responsibilities."

Graduate Study in Nursing takes its direction from the belief that nursing is a social institution designed to serve man in relation to his health status as determined by his preventive, therapeutic, and rehabilitative health needs. It draws from philosophy and from the natural and social sciences knowledges applicable to its own professional problems.

Graduate Study in Nursing contributes to the advancement of the profession of nursing by the development of understandings and abilities essential to leadership roles in nursing and their correlation with those of other health disciplines, to an extension of nursing knowledge and its application to current and emerging health needs of society, and to effective group functioning.

The ultimate aim of Graduate Study in Nursing is the improvement of nursing practice and of nursing education. To this end, Graduate Study in Nursing furthers individual professional de-

velopment and fosters the use of thought processes such as analysis, synthesis, and evaluation essential to the solution of problems associated with the provision of nursing services and the education and supervision of nursing personnel. It provides organized programs of study designed to realize its aim.

At Duke University, Graduate Study in Nursing has as its purpose the provision of learning opportunities for graduates of accredited baccalaureate programs in nursing to develop: advanced nursing competency in patient care; ability to communicate these learnings through the process of teaching and supervising in nursing; ability to critically consume, utilize, promote and participate in research in nursing and allied health fields; and ability to assume and use leadership roles and resources for the advancement of the Profession of Nursing and for continued professional growth.

REQUIREMENTS FOR THE MASTER OF SCIENCE IN NURSING

1. Satisfaction of subject matter deficits in undergraduate study that have resulted in provisional admission to graduate study, such as psychiatric and public health nursing and educational psychology or their equivalents.
2. Matriculation for the degree Master of Science in Nursing upon satisfactory completion of the initial 12 units of graduate work and the approval of the Director of Graduate Studies.
3. Satisfactory completion of the program of studies.
4. Passed comprehensive examination.

RESIDENCE REQUIREMENTS. Candidates for Master's degree must spend, as a minimum, one calendar year at Duke University. Often more time will prove necessary depending upon the nature of the student's program of studies.

TRANSFER OF GRADUATE CREDITS. Under certain circumstances a maximum credit of 6 units may be allowed for graduate courses completed elsewhere. The acceptance of credit up to this amount, however, will not reduce the minimum period of full-time registered residence at Duke University.

TIME LIMITS FOR COMPLETION OF MASTER'S DEGREES. The candidate for the Master's degree who is in residence for consecutive academic years should complete all requirements for the degree within two calendar years from the date of her first registration in the Graduate Program. Any candidate must complete all requirements within six calendar years of her first registration.

Credits earned over a longer period of time cannot be credited toward a degree.

In her graduate work the student must present satisfactory achieve-

ment for a minimum of 38 units of graduate credit. Nine of these units are earned outside of the major (Nursing) and are selected with the approval of the major professor from the course offerings in the natural and social sciences which correlate with her program of study in Nursing.

GRADUATE STUDY IN NURSING

Emphasis is placed throughout graduate study in nursing on critical thinking and on the ability to analyze and evaluate situations, to identify problems, to synthesize knowledges for arriving at conclusions, solutions, or improvements, to teach and guide others, and to function within an organized social group such as a faculty or service agency.

The interrelatedness of principles and processes involved in nursing care and in the teaching and supervising of nursing is stressed. Problems affecting either or both are the content of nursing seminar.

Nursing theory, research process, and functional subjects are presented in a correlated manner and concurrently with directed experience in patient care and in the teaching or supervising of nursing care.

The curriculum also includes courses that enable the student to deepen understanding of the scope of nursing and of nursing education; the major problems confronting the profession; the changing social scene and related health organization and leadership roles in nursing; and the relatedness of nursing to other disciplines concerned with human welfare.

Theory concerned with human interacting and with the psychophysiological aspects of health and illness is offered. Provision is made for both intra and interdisciplinary communication and collaboration. Students are assisted toward a conscious and purposeful use of the professional self.

Research orientation is accomplished through theory in research process and methodology, nursing research seminar, and the inclusion of related researches in other course content. Students are required to define a research problem in nursing and to develop the research design. The completed dissertation is not a requirement for the Master of Science in Nursing. Research guidance is provided for the realization of the research requirement and is extended for the student who elects to complete the dissertation.

The general curriculum design for graduate study includes the following courses required of all graduate students of nursing:

Research in Nursing ..... (2 units)
Seminar in Nursing Research ..... (3 units)

Principles and Processes of Teaching and Supervising in Nursing ..... (2 units)
Curriculum Development and Improvement in Nursing ..... (3 units)
Perspectives in Health Promotion and Patient Services ..... (3 units)
Human Behavior and Psychophysiology ..... (4 units)
Related Science ..... (9 units)

In addition, individual programs provide theory, practice and seminar for both the advancement of clinical nursing competency and the development of initial competency in teaching or supervising within the student's selected area of clinical specialization in nursing (12 units).

The program of study covers two semesters and the full summer session. Students are admitted in the Fall of each year.

Medical-Surgical Nursing Program

Fall Semester

*N231 Medical and Surgical Nursing	6 units
N235 Research in Nursing	2 units
N250 Human Behavior and Psychophysiology	2 units
N233 Principles and Processes of Teaching and Supervising in Nursing	2 units
Related Science	3 units
	15 units

Spring Semester

*N232 Medical and Surgical Nursing	6 units
N234 Curriculum Development and Improvement in Nursing	3 units
N251 Human Behavior and Psychophysiology	2 units
Related Science	3 units
	14 units

Summer Session

*N237 Perspectives in Health Promotion and Patient Services	3 units
N239 Seminar in Nursing Research	3 units
Related Science	3 units
	9 units

N231-232. MEDICAL AND SURGICAL NURSING (12 units).—Provides theory; directed experience in patient care and in the teaching and supervising of nursing; and nursing seminar. Studies and evaluates patient needs and related nursing process in light of natural, behavioral and health sciences. Stresses the continuum of care, rehabilitation philosophy and principles, and interdisciplinary collaboration for patient welfare. Seminar is directed at the identification, evaluation, and solution of problems affecting nursing and the teaching or supervising

* Includes: Theory (2); Directed Clinical Experience (3); and Nursing Seminar (1).
* Includes: Theory (2); Directed Teaching or Supervision in Nursing (3); and Nursing Seminar (1).
* Includes: Theory (2); and Selected Field Observations (1).

of nursing. Directed experience provides opportunity for: (1) advancing content, synthesizing knowledges and testing theories of nursing practice; and (2) the development of initial competencies in teaching or supervising in nursing.
(Fall and Spring Semesters) MISS MATTINGLY AND STAFF

N233. PRINCIPLES AND PROCESSES OF TEACHING AND SUPERVISING IN NURSING (2 units).—Considers the principles and processes of teaching and supervising and their application to nursing. Studies criteria for the selection and use of methods and materials in formal and informal learning-teaching situations in nursing. (Fall Semester) MISS MINNIEAR

N234. CURRICULUM DEVELOPMENTS AND IMPROVEMENT IN NURSING (3 units).—Studies trends and factors influencing curriculum development in nursing, educational programs in nursing, essentials to curriculum improvement, and criteria for program evaluation. MISS MATTINGLY

(Spring Semester, Prerequisite N233)

N235. RESEARCH IN NURSING (2 units).—Studies research process and methodology through analytical and critical review of research in nursing and related fields, the definition of individual research problems in nursing, and the formulation of research designs. (Fall Semester) MISS MATTINGLY

N237. PERSPECTIVES IN HEALTH PROMOTION AND PATIENT SERVICES (3 units).—Examines leadership roles in nursing as related to the current and emerging social scene and programming at the local, national, and international levels. Offers selected field observation and conference experiences.
(Summer Session) MISS MINNIEAR

N239. NURSING RESEARCH SEMINAR (3 units).—Provides opportunity for students to present and justify their individual research problems and to analyze previous learnings toward the identification of additional problem areas for nursing research. MISS MATTINGLY

N250-251. HUMAN BEHAVIOR AND PSYCHOPHYSIOLOGY (4 units).—Presents the current theory of psychophysiology with the aim to develop deepened appreciation of the personality-illness relationship and of the influence of psychological factors in the genesis of somatic reactions and of somatic disease.
DR. RECKLESS

RELATED SCIENCE. Students elect nine units of credit from the course offerings in the natural or social sciences which correlate with their nursing subjects and can be taken concurrently with them.

THE SUMMER SESSION

First term begins June 12, 1965

Second term begins July 19, 1965

To Former Students and Prospective Students of the Summer Session

The Summer Session at Duke University makes available to Duke students, to students from other universities and colleges, to teachers in elementary and secondary schools, and to other special students a notable program of instruction in many fields of knowledge, both academic and professional.

Course programs offered during the summer are designed to meet special and particular needs as well as the more conventional requirements leading to specific degrees.

Undergraduates of Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending two or more Summer Sessions.

Graduates of accredited high schools, both men and women, who have been admitted to the freshmen class of Duke University may begin their work in the Summer Session.

Undergraduates from other colleges and universities may enjoy the special advantages of summer instruction at Duke and transfer earned credits to their own institutions.

Graduate students who have been admitted to the Graduate School to study for the Master of Arts, Master of Education, and Master of Arts in Teaching degrees will find courses arranged in sequence from summer to summer to meet their requirements.

Teachers from elementary and secondary schools who desire to earn credits toward the renewal of their certificates and who are interested in further teacher training in subject content and method may enroll in senior-graduate courses as special or unclassified students.

While the summer course program meets in many departments the needs of degree candidates, it goes beyond these limits in presenting also courses of wide general interest and, in addition, special non-credit lectures. conferences, institutes, and workshops.

Duke University's ample and modern research facilities will be available during the summer to all properly qualified students. It is the hope of the University, of the summer faculty, and of the administrative officers that former students and new students will find increasing values in each summer spent at Duke.

THE DIRECTOR

Admission

Students in the following categories may be admitted to the Duke University Summer Session:

1. Graduates and undergraduates who are presently enrolled and in good standing in Duke University.
2. Graduates and undergraduates who have been formally admitted, or re-admitted, to Duke University.
3. Students who are currently in good standing at their respective institution and who have approval by the proper authority to take and transfer credits earned in the Duke Summer Session.
4. Teachers in service with or without the Bachelor's degree who wish to earn credits for certification purposes.

Admission to specific courses offered in the Summer Session is governed by the student's academic status (freshman, sophomore, junior, senior, graduate, special or unclassified) and by the prerequisites of the course in question.

Students in Residence at Duke University during the Spring Semester 1965

A Duke University student, either graduate or undergraduate, who plans to attend the Summer Session should at the time of pre-registration for the fall semester (see p. 21 for specific dates) enroll for the desired Summer Session courses. He need *not* file with the Summer Session the application blank at the end of this *Bulletin*.

Students Not in Residence at Duke University during the Spring Semester 1965

UNDERGRADUATES. New students seeking to enter Duke University as freshmen or as undergraduates with advanced standing, and undergraduates who wish to re-enter the University should write the Office of Admissions requesting application forms.

Undergraduates, both men and women, enrolled in other colleges and universities who desire to earn in the Duke University Summer Session credits which are to be transferred to their own institutions should apply directly to the Director of the Summer Session, Duke

University, on the application form at the end of this *Bulletin.* They should give accurately and clearly all information called for on the application form.

GRADUATES. Students with graduate standing and teachers in service with or without the Bachelor's degree who wish to earn credits toward the renewal or the advancement of their certificate and who do not wish to become candidates for a degree at Duke University should apply to the Director of the Summer Session on the application form at the end of this *Bulletin.*

Graduate students who are seeking admission to the Graduate School of Arts and Sciences and those who have been admitted to the Graduate School must apply to the Director of the Summer Session on the application form at the end of this *Bulletin.* Those who are seeking admission to the Graduate School *must also file* Graduate School application forms which may be secured by writing to the Dean of the Graduate School, Duke University, Durham, North Carolina.

Admission to Degree Candidacy

Credits earned during the Summer Session may be applied toward the requirements of a degree.

UNDERGRADUATES. A student seeking to enroll as a candidate for the Bachelor's degree from one of the colleges of Duke University must meet the entrance requirements set forth in the *Bulletin of Undergraduate Instruction* and be accepted by the Director of Admissions. This *Bulletin* may be secured by writing the Office of Admissions, Duke University.

GRADUATES. A student seeking to enroll as a candidate for one of the advanced degrees offered by the Graduate School of Arts and Sciences of Duke University must meet the requirements set forth on pages 33-41 of this *Summer Session Bulletin.*

Financial Information, Living Accommodations, and Medical Care

Fees

The University Fee:
Covering registration, tuition, and medical care.....$35.00 per semester hour ($35.00 per unit in Graduate School)
Teachers in full-time service in Elementary and Secondary schools.....$15.00 per semester hour
Divinity School students approved by the Dean of that school.....$17.50 per semester hour

Laboratory Fees: (These where applicable are in addition to the University Fee.)
Marine Laboratory.....$10.00 per course
(For Marine Laboratory investigators' research table fees see Marine Laboratory Bulletin.)

Fees Replacing University Fee:
Medical Mycology.....$100.00

Master's Degree Summer Session Fee:
A candidate for the Master's degree who completes in the Summer Session 15 or more semester hours required for the degree and who finishes the work in the Summer Session pays a degree fee of.....$ 25.00
A Master's degree candidate who is not required to pay the fee under Item 1 above, but who takes a thesis examination during the Summer Session, is required to pay a degree fee of.....$ 10.00
A Master's degree candidate who, in the fall or spring semesters, completes 15 or more semester hours required for the degree and who finishes the work in the Summer Session without a thesis examination is not required to pay the degree fee.

Auditing Fees (See p. 24 for definition):
1. Students registered for a full course program may audit non-laboratory courses (with the permission of the Director) at no extra charge.
2. Students carrying less than a full course program may be granted permission to audit a course or courses on payment of half the University fee per semester hour audited.....$17.50 per s.h.

Late Registration Fee:
Students who fail to register prior to the first class day of a given course will pay an extra fee of.....$ 5.00

Fee for Course Changes:
Course changes other than those required by the University will be made only on payment of an extra fee of.....$ 1.00

Fee for Make-up Final Examination.....$ 5.00

Refund of Fees:
a. When applications for withdrawal are received by the Director of the Summer Session before the close of registration on registration day, full fees will be refunded.

b. When applications for withdrawal are received by the Director of the Summer Session during the first four class days of a given term 80 per cent of the fees will be refunded.

c. When applications for withdrawal are received by the Director of the Summer Session after the fourth class day there will be no refund of fees.

Student Aid

SPECIAL FEES TO TEACHERS: Teachers in full-time service in elementary and in secondary schools, who are accepted by the Summer Session, pay only $15.00 per semester hour. Teachers on leave of absence from their schools and teachers not currently employed are not eligible for this special fee.

SCHOLARSHIPS FOR PUBLIC SCHOOL PERSONNEL: Duke University will offer thirty-six special scholarships of $150.00 each to high school and elementary teachers on a competitive basis (not by a written examination) for the Summer Session of 1965. This scholarship program is designed to encourage teachers to begin or to continue their graduate studies leading to the A.M., M.Ed., or M.A. in Teaching degree.

Duke University will again offer six special scholarships of $200.00 each to high school and elementary administrators and supervisors. This scholarship program is designed to encourage principals and supervisors to continue their graduate studies leading to advanced degrees.

Although successful applicants for the scholarships will not be required to become candidates for a degree, they must qualify for and receive admission to the Graduate School of Arts and Sciences.

All applications with supporting documents must be submitted by April 1, 1965. Selection and appointment of scholars will be completed by May 1, 1965.

Application blanks and complete information may be obtained from the Director of the Summer Session, Duke University, Durham, North Carolina.

LOANS: A number of loan funds have been established for the benefit of the students of Duke University. Several of these funds are available to students enrolled in the Summer Session. These funds are administered through a committee of officers of the University.

The Committee, in approving loans, selects those students who, from the standpoint of character, scholastic attainment, and degree of financial need, are deserving of consideration.

Applicants for loans should make application to the Manager, Student Loan Office, Duke University. All applications must be initiated during the first week of each term. The granting or withholding of a loan is a matter entirely within the discretion of the

Student Loan Committee. A student is expected to use all other possible means of securing financial assistance before applying for aid from a loan fund.

NATIONAL DEFENSE EDUCATION ACT LOANS: A limited number of loans may be made, under the provisions of the National Defense Education Act of 1958, to students in the Summer Session who have been regularly enrolled in the University prior to the Summer Session. Inquiries concerning opportunities available under this program should be addressed to the Manager, Student Loan Division, Duke University.

REMISSION OF TUITION: Children of ministers who are members of the North Carolina and Western North Carolina Conferences of the Methodist Church are entitled to a remission of the tuition charge as are the children of ministers of all faiths residing in Durham County, North Carolina. This consideration is given only to the children of resident members of the two North Carolina conferences who are giving their full time to religious work. The remission of the tuition charge during the Summer Session is valued at one-half of the tuition charge. Only those students enrolled in a regular undergraduate program leading to a baccalaureate degree from Duke University are entitled to this benefit. Students in this group are entitled to a maximum of eight semesters of free tuition at the undergraduate level. Application for this benefit should be made to the Director of Financial Aid, Duke University.

TUITION GRANTS: Tuition grants are available to children of qualified staff members of Duke University. Information regarding the tuition grant program may be obtained by writing to the Director of Financial Aid, Duke University.

Residence Hall Accommodations

The residence hall facilities of Duke University will be available to Summer Session students. The Men's Graduate Center will be used for graduate and professional men students enrolled in the Summer Sessions; however, the Men's Graduate Center dining hall will not serve meals during the Summer Session. Graduate and undergraduate women reside in residence halls on West Campus during the Summer Session.

The Duke University Apartments will be available to married graduate students enrolled in the Summer Session. Information concerning Duke University Apartments will be supplied by the Director of Housing upon receipt of your request.

UNDERGRADUATES, both men and women, are required to live in the residence halls unless they are married or living with par-

ents or relatives. Any exception must be approved in advance by the Dean of Undergraduate Women or the Dean of Undergraduate Men as the case may be.

The majority of the rooms are double rooms furnished for two persons. A limited number of rooms are single and are furnished for one person, and are assigned in the order of receipt of application in the Housing Bureau. The Housing Bureau will convert a double room to a double/single and furnish it for occupancy by one person. Furniture consists of single bed with mattress, clothes closet, a chest of drawers for each person, a study table, chairs, bookcase, waste-basket, and window shades. Linens, blankets, towels, pillows and desk lamps are not furnished by the University.

The Duke University Marine Laboratory, located on Pivers Island adjoining the United States Bureau of Fisheries across the Newport River from Beaufort, North Carolina, has cottage-type residence halls which will be available for Summer Session students. All rooms in the Marine Laboratory residence halls are equipped for two persons. There is a separate building for dining and social activity. Rates for these rooms are the same as shown below. It is not anticipated that there will be any double rooms furnished as single rooms for the Summer Session. Reservations for rooms at the Marine Laboratory, Beaufort, should be made with the Business Manager, Duke University Marine Laboratory, Beaufort, North Carolina, by submitting a Summer Session residence hall application with your personal check for the amount of your room rent.

Residence Hall Rooms—Rates

Single Room	5 weeks' term	$41.25	
	4 weeks' term	33.00	
	3 weeks' term	24.75	
	1 week's term	8.25	
Double Room	5 weeks' term	$70.00	$35.00 per person
	4 weeks' term	$56.00	28.00 per person
	3 weeks' term	42.00	21.00 per person
	1 week's term	14.00	7.00 per person
Double Room furnished as a Single Room and Occupied by one person	5 weeks' term	$56.25	
	4 weeks' term	45.00	
	3 weeks' term	33.75	
	1 week's term	11.25	

Applications for room reservations at Duke University, Durham, accompanied by the full amount of the room rent for the term concerned should be made to Director of Housing, Duke University, Duke Station, Durham, North Carolina. Rooms will be reserved in the

order in which applications are received, and on certification of admission by the Summer Session Director. Notification of assignment to rooms will be made about May 30 for the first term; about July 10 for the second term.

Rooms are available to applicants twenty-four hours prior to the registration for a specific term of the Summer Session. A room is to be vacated by the occupant within twenty-four hours after his final examination. Any period of occupancy, other than for a specific term of the Summer Session, must be arranged with the Director of Housing, House D, Room 101-R, Duke University.

REFUND OF ROOM RENT:

a. When notification for room cancellation is received by the Housing Bureau on or before fifteen (15) days prior to the registration date of the Summer Session term full room rent will be refunded.

b. When notification for room cancellation is received between the fifteen (15) days prior to registration date and the first four class days, 80% of the room rent will be refunded.

c. When notification for room cancellation is received after the first four days of a Summer Session term, 70% of the room rent for the unused period will be refunded.

Applicants should be sure to express their preference as to roommates, if they have a preference. If no preference of roommate is expressed the Director of Housing will assign a roommate; however, he does not assume responsibility in this matter.

Estimated cost of one term of Summer Session:

University Fee, 6 s.h.	$210.00
Teachers (elementary and secondary) in full-time service, $90.00	
Dormitory Rooms (2 occupants, $35.00 per person)	35.00
Meals (Cafeteria selective; average per day $2.00)	72.00
Books and Class Materials $7.00 to $10.00	8.50
Miscellaneous (laundry, etc.)	12.00
Total (elementary and secondary teachers in full-time service deduct $120.00)	$337.50

Medical Care

The Student Health Service, in the Duke Medical School Building operates during the Summer Session and offers exactly the same medical and surgical services available to each full-time student during the academic year, as described completely in the Undergraduate Bulletin, but covers only *six days* of hospitalization in each term of Summer Session residence.

With the exceptions noted below, this service, under the direction of the University Physician, and with the cooperation of the staff of Duke Hospital, furnishes full medical and surgical care, drugs, dressings, x-ray work, and ward, but not special nursing, for any acute illness or injury, at no additional cost beyond the University fee for

each term of residence or any shorter period. The cost of braces and necessary orthopedic appliances and of blood, as well as special nursing, must be borne by the student. A charge for meals ($1.80 per day) will be made while the student is in the Hospital. All necessary telephone and telegraph charges will be borne by the student. If students have insurance providing hospitalization, surgical or medical benefits, these benefits shall be applied to the cost of their medical care. Refraction of eyes, treatment of teeth, and of all chronic and pre-existing conditions such as diseased tonsils, hernias, elective surgery, chronic skin conditions, endocrine disturbances, etc., or accidents or illness occurring during vacations or while off the campus are not included in this service.

No illness is treated in dormitory or other rooms occupied by students. Students needing treatment for minor medical or surgical conditions have the facilities of the Student Health Office in the Hospital between 9:00 a.m. and 5:30 p.m. on week-days. Emergency room care is available at night and on Saturday afternoons and Sundays. For admission to the Hospital, or for x-ray and consultation services, a student *must* present the 1965 Summer Session Student Identification Card as evidence that he is matriculated in the Summer Session and entitled to hospitalization. Students who register for less than 3 semester hours' credit are not entitled to medical care without charge.

Registration

Definition of Terms

REGISTRATION. A student has completed registration for the Summer Session when:

1. His course program has been written and approved by the dean of the school or college in which he is enrolled or by the Director of the Summer Session in the case of the special or unclassified student.
2. Summer Session forms have been completed properly by the student in the Summer Session Office.
3. Summer Session University fees have been paid. A place in a course cannot be assured until fees have been paid. Tuition bills are not sent to the student's home.

PRE-ENROLLMENT. The term pre-enrollment refers only to the writing of the course program and its approval by the proper authority or by the Director of the Summer Session in the case of the special or unclassified student. *Pre-enrollment alone does not constitute registration.*

General Registration

CLASSES BEGINNING JUNE 14. All Summer Session students whose classes begin on June 14, Term I, who *do not* complete registration in the Summer Session Office, 119 Allen Building, on or before June 5 *must* present themselves at general registration in Central Records Office, 103 Allen Building, on June 12 to register. Students will register during 30-minute periods alphabetically according to *surname* as indicated in the following table.

Time	*Registrants (Surname)*
8:30– 9:00	A–B
9:00– 9:30	C–E
9:30–10:00	F–H
10:00–10:30	I–L
10:30–11:00	Mc–N
11:00–11:30	O–P
11:30–12:00	Q–R
12:00–12:30	S–T
12:30– 1:00	U–Z

CLASSES BEGINNING JUNE 21. All Summer Session students whose classes begin on June 21, Term I, must complete registration in the Summer Session Office, 119 Allen Building, on or before June 19.

CLASSES BEGINNING JULY 20. All Summer Session students who wish to register for courses offered during Term II or for research during Term II may register in the Summer Session Office on July 5 through July 17. All students who *do not* register for second term during this period *must* register in Central Records Office, 103 Allen Building, on July 19, between 8:30 a.m. and 1:00 p.m.

CLASSES BEGINNING ON OTHER DATES. All Summer Session students registering for courses beginning on dates other than those specified above must complete registration in the Summer Session Office *before* the date on which their classes begin. *Registration on the day on which classes are scheduled to begin will be considered late registration.*

Late Registration

Any student who fails to register on or before the dates specified in the preceding paragraphs will be charged a fee of $5.00 for late registration. No student will be permitted to register for a 3 semester hour course after the third class day (June 16, Term I; July 22, Term II); a 4 semester hour course after the second class day (June 22, Term I; July 21, Term II). Changes in courses other than those required by the University will require a payment of $1.00 for each change made. All changes must be approved by the dean of the school or college in which the student is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session. These registration rules are enforced rigidly.

Since Summer Session courses present a program of study in more concentrated and rapid form than in the regular semesters, students are advised to register on time and to be present at all class sessions.

Advance Registration

STUDENTS IN RESIDENCE AT DUKE UNIVERSITY DURING THE SPRING SEMESTER, 1965.

WRITING COURSE PROGRAMS IN THE SCHOOLS AND COLLEGES. Students in residence at Duke University during the Spring Semester, 1965, both graduate and undergraduate, who plan to enroll for courses offered in the 1965 Summer Session or to carry on research during the period of the Summer Session will write course programs and have

them approved in their respective schools or colleges during the week of pre-registration, April 6-9, 1965, except Divinity School students who will register on April 15-16.

Advance Registration in the Summer Session Office. Students in residence whose course programs have been written and approved by their respective colleges on the dates indicated above may complete their registration in the Summer Session Office, 119 Allen Building, on the following dates:

Graduate and undergraduate students—May 10 through June 5

Registration in the Summer Session Office includes:

1. Completion of various Summer Session forms.
2. Payment of University fees.

A student who registers with the Summer Session Office during this period will not be required to be present at general registration on June 12. He will begin his class work on the date his classes are scheduled to begin: June 14 or June 21.

STUDENTS NOT IN RESIDENCE AT DUKE UNIVERSITY DURING THE SPRING SEMESTER, 1965.

Advance Registration by Mail. Students not in residence at Duke University during the Spring Semester, 1965—new undergraduate students seeking to enter as degree candidates, graduate students who are not candidates for an advanced degree at Duke University, graduate and undergraduate students of other colleges and universities desiring to earn credits for transfer, public school teachers and college teachers (not advanced degree candidates)—may register by mail. Advance registration by mail includes:

1. Completion in full of the application form at the end of this *Bulletin*.
2. Admission to the Summer Session by the Director of the Summer Session and, in the case of students seeking to enter Duke University as degree candidates, admission by the Admission Directors to the school or college of Duke University concerned.
3. Completion in full and return of forms required by the Summer Session Office by June 5.
4. Payment of University fees by June 5. A student may *pre-enroll* by mail without paying the University fees but he *cannot register in advance* without doing so.

Students who complete registration by mail on or before June 5 need not be present at the general registration on June 12.

DEGREE CANDIDATE GRADUATE STUDENTS NOT IN RESIDENCE DURING THE SPRING SEMESTER, 1965. All graduate students not in residence during the Spring Semester, 1965, who are candidates for an advanced degree in the Graduate School of Arts and Sciences of Duke University *must* present themselves for registration in Central Records Office, 103 Allen Building, on June 12. They cannot complete registration by mail because:

1. Their program of study for the summer must be approved by their Director of Graduate Studies.
2. Their course programs must be written and approved by the Graduate School of Arts and Sciences.

These students may pre-enroll by mail with the Summer Session Office and may pay their fees in advance, but they cannot complete their registration.

Academic Regulations

Kinds of Course Enrollment

SUMMER SESSION courses may be taken for "credit" or for "non-credit" or may be "audited." A student's program may be exclusively in one of these categories, or may combine any two of them or all three. Students taking a full or partial program for "credit" may enroll as auditors or as non-credit students in any number of additional courses.

CREDIT. The Summer Session term "credit" does not mean degree credit at Duke University unless the student has been admitted as a degree candidate by one of the colleges or schools of the University. A student taking a course for credit is expected to do all the work required and to take the final examination, and he will receive a grade. G.I. Bill benefits are available only to those veterans who enroll for credit.

NON-CREDIT. "Non-credit" enrollment is available to the student who wishes the privilege of participating in class discussions, exercises, and the laboratory assignments but does not wish to take the examinations, either mid-term or final. A "non-credit" student may do as much of the work of the course as he desires, but he may not take the final examination and he will not receive a grade. Full fees of $35.00 per semester hour are required in "non-credit" enrollment.

AUDIT. An auditor is entitled to listen to lectures and class discussions, but he may not participate in discussions or take examinations. Students may not enroll as auditors in laboratory courses. A student carrying a full program for credit may be given permission to audit as many courses as he desires without additional fees. Students carrying less than a full program for credit may secure permission to audit but are required to pay the auditing fee of $17.50 per semester hour.

Eligibility for Course Enrollment

Courses numbered 1-49 are primarily for freshmen, or freshmen and sophomores. Courses numbered 50-99 are ordinarily for sophomores, or sophomores and juniors. Courses numbered 100-199 are designed for juniors and seniors. Courses numbered 200-299 are planned for seniors and graduates. Courses numbered 300 up admit graduate students only. Courses numbered from 200 up are limited in enrollment to 25 students.

Credits Allowed in Summer

The Summer Session courses are of the same quality and credit values as courses in the regular semester. Credit earned in the Summer Session is in terms of semester hours. The majority of Summer Session courses carry 3 semester hours' credit and require one term in residence. A limited number of basic courses in the sciences carry 4 s.h. credit (Chemistry, Geology, Physics, Zoology).

The Normal Course Program

The normal and maximum program for one term of the Summer Session is 6 semester hours, except in cases where students take a 4 semester hour language course. In those cases 7 semester hours per term will be allowed. The 4 semester hour courses in the sciences run for four weeks and one such course constitutes a full course program. Four semester hour courses in the sciences do not meet on Saturdays.

Grading

Only a student taking a course for credit will receive a grade. The grade given represents the quality of the work done in the course.

PASSED.

Undergraduate Grades	*Graduate Grades*
A—excellent	E—exceptional
B—good	G—good
C—average	S—satisfactory
D—poor but passing	

FAILED. A grade of F indicates that the student has failed the course, and in order to receive credit for the course he must repeat the work in class.

INCOMPLETE. A grade of I may be reported by the instructor if for any reason he is unable to report the final grade at the regular time. Incomplete courses must be completed before the close of the succeeding semester; otherwise the I is recorded as F, and the course must be repeated in class if the student is to receive credit for it.

ABSENT FROM FINAL EXAMINATION. The grade X indicates that the student was absent from the regularly scheduled examination. A student absent from examination, if the absence has been excused by the dean of the college or school in which he is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session, may receive an examination upon the payment of $5 to the Treasurer of the University. The instructor concerned arranges for the examination in cases where absences are excused. A student with an X grade who has not obtained a passing grade before the end of the semester following that in which the X was incurred is regarded as having failed in the course concerned and must repeat the work in class in order to receive credit. If a student's absence from an examination is not excused by the dean of the college or school in which he is enrolled or, in the case of the special or unclassified student, by the Director of the Summer Session, his grade for the course concerned is recorded as F.

Dropping of Courses

If a student drops a course without permission from the dean of the school or college in which he is enrolled or, in the case of the special or unclassified student, the Director of the Summer Session, the grade for that course is recorded as F. If he drops a course with permission, the grade for that course is F unless, in the judgment of the dean or director, circumstances do not justify this penalty.

Withdrawal from the Summer Session

If a student wishes to withdraw from the Summer Session, he must notify both the dean of the school or college in which he is registered and the Director of the Summer Session.

Examinations

Final examinations in courses are held on the last two days of each term. Final examinations for short courses which occupy the student's complete program will be held on the last day of the course. The examination dates for 1965 are:

First term: July 16, 17.
Second term: August 23, 24.

Courses in science for the first term have been scheduled so that their final examination will come on July 16. The science courses which begin July 20 and run for four weeks will have their final examination on August 17. The University has no provision for giving examinations *in absentia*. Students absent from examinations for valid reasons are permitted a liberal extension of time to return to the University for completion of credit.

Credits for Transfer

A student desiring either graduate or undergraduate credits transferred from Duke University to his university or college as degree credit must request from the Director of the Summer Session, Duke University, a "Course Approval Form" to be completed by the student's Dean or Registrar and return to the Director of the Summer Session, Duke University.

Professional Credits Toward Teacher's Certificates

Professional credits toward teacher's certificates are granted by the various state boards of education, each in accordance with its own carefully planned rules. Teachers in service, before enrolling for certification credit, should consult the rules laid down by their State Board of Education. If necessary, they should send to their State Board of Education a list of the courses in which they plan to enroll and inquire whether these will be acceptable for certification credit.

University Services, Publications, and Student Activities

Appointments Office

THE APPOINTMENTS OFFICE is maintained in Page Building the year around. The services of this Office are available without charge to students and teachers registered for a degree in Duke University and to school officials who may be seeking the services of new teachers. Students interested in securing employment through the Appointments Office should register with this Office.

The University Counseling Center

The University maintains a University Counseling Center which provides a centralized program of educational, vocational, and personal counseling for students. This confidential counseling service on problems of personal, social, educational, and vocational adjustment is provided without cost to students enrolled at the University. In addition, the Center administers special group testing programs for University schools and departments and serves as the local testing center for a wide variety of national testing programs. The Center also carries on programs of research in the field of measurement and counseling. Although the counseling, testing, and research services of the Center are designed primarily to meet the needs of the students, the faculty, and the staff of Duke University, these services are made available to individuals and organizations outside the University as its facilities permit. Requests for further information should be addressed to the Director, University Counseling Center, Duke Station, Durham, North Carolina.

Post-Doctoral Research

Scholars engaged in post-doctoral research find it advantageous and sometimes essential to use in summer the resources of the Duke University libraries. The University welcomes these visitors and makes available to them the living accommodations of the dormitories and the dining halls during the Summer Session, June 12 to August 24.

Application for these post-doctoral research privileges must be made in advance by letter to the Director of the Summer Session giving the applicant's present position, the specific field of his research interest, and the dates during which he desires to be in residence. Approved applicants will be accepted subject to the availability of library and of dormitory space.

The Sundial

During the Summer Session the University will publish each Saturday *The Sundial,* an official calendar announcing events—academic, social and recreational—of the following week. This calendar also includes official notices concerning academic requirements. Students are expected therefore to read *The Sundial* regularly.

Recreation and Activities

The Summer Session will provide a varied program of entertainment and recreation. These plans include movies, presented once weekly by Quadrangle Pictures, weekly summer dances and open house social evenings with games for those who do not care to dance. Tours to areas of interest can be arranged for week-ends. Both the mountains and the seashore are easily accessible. Adequate facilities are available for those interested in swimming, tennis, and other sports. State clubs organized for the summer play an active part in all social activities.

Resources of the University



THE UNIVERSITY LIBRARIES, with 1,700,000 volumes and 3,800,000 manuscripts, provide exceptional resources and facilities for study and research by undergraduate and graduate students and visiting scholars. About 60,000 volumes are added annually, while 120 foreign and domestic newspapers and 7,500 periodicals are received currently. There is also a large collection of microfilms of rare books, newspapers, and periodicals. Study facilities are provided for 269 graduate students in air-conditioned stacks of the General Library.

All libraries of the University are open for use throughout the summer. A "Student's Guide to the General Library," and a brochure

on "The Library of Duke University" which describes the building and collections in general detail are available on request addressed to the Librarian of the University.

The laboratories in the various Science Departments (Botany, Chemistry, Physics, Psychology, and Zoology) are designed for both teaching and research. Ideal locations for special work in some of the sciences are available at Duke University Marine Laboratory at Beaufort, North Carolina; at Highlands Biological Laboratory at Highlands, North Carolina; in the Duke Forest at Durham, North Carolina; and in the Sarah P. Duke Gardens on the West Campus of Duke University.

The Chapel, home of Duke University Church, interdenominational, is open all summer. The Church encourages the cultivation of the spiritual and moral life of students through participation in the service of worship which is held each Sunday morning at nine-thirty o'clock. The pulpit is occupied by a regular University Preacher, or a special visiting preacher. Choral music for these services is provided by a volunteer student choir.

Special Conferences and Courses



SPECIAL PROGRAMS FOR TEACHERS OF SCIENCE AND MATHEMATICS: It is anticipated that the Summer Session will offer a number of special programs at the graduate level designed specifically for high school teachers of science and mathematics. For detailed information on the programs, teachers should write Dr. Thomas Reynolds, Mathematics Department, Duke University, Durham, North Carolina.

CONFERENCE ON SCHOOL LAW: A conference on school law will be held on Duke University campus on June 22-23. The program is planned for the benefit of administrators and teachers in schools and colleges. Speakers and consultants well known in the field of school law will participate in the two-day conference.

CONFERENCE ON ELEMENTARY EDUCATION: June 17-18, 1965. This conference is the eleventh of a series of conferences dealing with various areas of learning in the elementary school. The area of learning to be considered in this conference will be art. Mr. Al Hurwitz, Supervisor of Art Education for the Dade County Schools, Miami, Florida, a nationally known authority in the field will be the consultant and main speaker for the conference. Mr. Hurwitz has

worked with children in art for several years. He has conducted TV classes, written, and lectured on the subject. He is highly recognized for his understanding of the problems of the Art Education program in the public schools. For further information write to the Director of the Summer Session, Duke University, Durham, North Carolina.

MODERN MATHEMATICS WORKSHOP FOR ELEMENTARY TEACHERS: The Duke University Summer Session with the cooperation of the North Carolina State Department of Public Instruction will offer a two-week workshop in modern mathematics for elementary teachers, June 17 to July 2.

The workshop will be instructional with emphasis on various topics of the content presently being stressed in the contemporary mathematics programs in the elementary grades. Participants in the workshop will be granted 2 s.h. credit for the workshop.

Registration fee for the workshop is $30.00 for public school teachers. There are *fifteen* $30.00 scholarships available for North Carolina public elementary teachers. For further information and application write to the Director of the Summer Session, Duke University, Durham, North Carolina.

SUMMER INSTITUTE IN ENGLISH: The Department of English in conjunction with the North Carolina State Department of Public Instruction will offer during Term I (June 12-July 17) an Institute for teachers of English in the secondary schools. The Institute will include instruction in Literature, Language, and Composition, as described in the Courses of Instruction below. The Institute will follow the general plan of the Institute offered in the summer of 1962 in conjunction with the Commission on English of the College Entrance Examination Board. The syllabi prepared under the supervision of the Commission on English will be employed. The instruction will carry graduate credit which may be applied to a degree program here or elsewhere. The Institute will be limited to about thirty teachers, all of whom will receive full tuition scholarships. For further information write: Director, Summer Institute, English Department, Duke University, Durham, North Carolina.

SOUTHEASTERN INSTITUTE OF MEDIEVAL AND RENAISSANCE STUDIES: The Southeastern Institute of Medieval and Renaissance Studies has been established for the advancement of scholarship and the improvement of teaching in the southeastern region. Through the Institute the resources of Duke University and the University of North Carolina—particularly library holdings—will be made available to scholars and teachers throughout the region. Students of all areas of medieval and renaissance studies will participate. The Institute will alternate annually between the campuses of Duke University and the University of North Carolina at Chapel Hill.

The first session, from July 19 to August 25, 1965, will be held on the University of North Carolina campus.

HIGHLANDS BIOLOGICAL STATION: Duke University holds a subscribing instructional membership in the Highlands Biological Station at Highlands, North Carolina, on the southern edge of the Blue Ridge Mountains at an elevation of 4,118 feet. The situation and the region offer an excellent opportunity for field studies and limited laboratory work. A limited number of qualified students in Botany and Zoology may make arrangements to carry out research at this station.

MEDICAL MYCOLOGY: A month's course in Medical Mycology, under the direction of Dr. Norman F. Conant, is to be offered at Duke University School of Medicine and Duke Hospital, July 5 to July 31, 1965. The course will be offered every day in the week, except Sunday, and has been designed to insure a working knowledge of the human pathogenic fungi within the time allotted.

Emphasis will be placed on the practical aspects of the laboratory as an aid in helping establish a diagnosis of fungus infection. Insofar as possible and as patients become available, methods of collecting materials in the clinic for study and culture will be stressed. Work with patients, clinical material, cultures, and laboratory animals will serve as a basis for this course. Also, an opportunity to study pathologic material, gross and microscopic, will be given those whose previous training would allow them to obtain the greatest benefit from a study of such material.

The enrollment for the course will be limited and the applications will be considered in the order in which they are received. An attempt will be made, however, to select students on the basis of their previous training and their stated need for this type of work.

A fee of $100.00 will be charged for this course, upon the completion of which a suitable certificate will be awarded. Please direct inquiries to Dr. Norman F. Conant, Professor of Microbiology, Duke University School of Medicine, Durham, North Carolina.

THE METHODIST COURSE OF STUDY SCHOOL: The seventeenth session of the short-term school for Methodist ministers taking the required Course of Study will be conducted during the period, July 12-August 6, 1965. While this school is designed primarily for Supply Pastors and other non-seminary candidates for the Methodist ministry, clergymen of any denomination may enroll. The curriculum as approved by the 1964 Methodist General Conference will be followed, which will include Studies for License to Preach, Introductory Studies and the Studies for the First, Second, Third, and Fourth Years.

In addition to class work, there is provision for daily worship and a number of special lectures and workshops. A varied program of recreation and athletics will be supervised by the University Department of Physical Education.

Registration is scheduled for July 12. Classes begin on the morning of July 13 and continue through August 6. A descriptive folder giving details of the School will be ready for distribution about March 1, 1965, and copies may be procured by writing to Professor W. A. Kale, Director, Box 4353, Duke Station, Durham, N. C.

Divinity School Summer Clinics

Three clinics, Preaching, Pastoral Care, and Rural Church Work will be held simultaneously, July 19-30, 1965. Costs include: Registration Fee, $10.00, Tuition, $40.00, and Board and Room. All participants are eligible for Tuition Grants. In addition, Methodist Ministers in North Carolina may inquire about special grants provided by agencies of the Annual Conferences to cover costs. Registration is open to ministers of all denominations. No academic credit is given.

PREACHING: This is the eighth Clinic in Preaching to be held at Duke. Registration is limited to eighteen in number, preferably restricted to active ministers and chaplains who have been out of seminary five years or more. The Clinic will concern itself mainly with principles of sermon construction and delivery, giving ample opportunity for the participants to preach for critique. Matters of common concern for preachers will be discussed in plenary sessions. For registration information write to Professor Thor Hall, Director.

PASTORAL CARE: The Clinic in Pastoral Care has as its theme the psychological and theological dimensions of selfhood. Through lectures, discussions, hospital visitation, and verbatim conferences aspects of the theme are explored: the meaning of selfhood, the self in crisis and the ministry of the Church to those caught in the crisis of illness, the action of God in the midst of suffering, and the personal and sacramental means of grace. Hospital visitation supervised by the Chaplains to the Duke Medical Center forms an integral part of the program. For registration information write to Professor Richard A. Goodling, Director.

RURAL CHURCH: The Rural Church Clinic will consist of intensive training, study, and planning in the area of the Church's responsibilities in the town and country community, giving particular emphasis to the development of an indigenous leadership. For registration information write to Professor M. Wilson Nesbitt, Director.

Graduate Study in the Summer Session

Summer Sessions offer an excellent opportunity to advance or complete programs of graduate study already undertaken, to begin study toward a graduate degree at Duke University, to acquire graduate training useful in professional advancement, or to study for personal satisfaction. The several departments offer a variety of graduate courses, as listed in later pages, given by members of the Duke faculty and visiting professors. Especially full programs are provided in Botany, Education, English, History, Psychology, Sociology, and Zoology.

Students Not Seeking Admission to the Graduate School. Any student who holds an A.B. or B.S. degree and who does not intend to earn an advanced degree at Duke University but who desires graduate work for professional or other reasons should apply to the Director of the Summer Session for admission as an unclassified student. Credit earned by an unclassified student will serve all usual purposes except that it will not count toward an advanced degree at Duke University.

Students Seeking Admission to the Graduate School. Admission may be granted to a student who has received an A.B. or B.S. degree from an accredited institution after a four-year course of study. The undergraduate record should be well rounded and of such quality as to give evidence of real capacity for success in graduate study. A student who seeks admission should 1) secure an application blank from the Graduate School and promptly return it with the required information, 2) have mailed directly from the registrar of each college he has attended to the Dean of the Graduate School at Duke University an official transcript of all his undergraduate or graduate work, 3) have mailed to the same official at least two, and preferably three, letters of recommendation from persons best qualified to appraise his capacity for graduate study.

In addition, many departments welcome, the departments of Economics and Psychology strongly advise, and the departments of Biochemistry and Philosophy require, submission of scores on the aptitude and advanced test in major subject of the Graduate Record Examination. If possible, the student should take this examination before his intended registration. Arrangements can usually be made through officials at the student's college or by correspondence with the Educa-

tional Testing Service, 20 Nassau Street, Princeton, New Jersey. Should a student be unable to take the examination before the final admission date, he may—if his other documents are acceptable—be granted "provisional" admission until he takes the examination, which he must arrange to take at the first time it is offered after his "provisional" admission. Students admitted to the Graduate School will be so notified by the Director of Admissions.

So that applications for admission to the Graduate School for summer work may be given full consideration, the student must submit all required documents to the Dean of the Graduate School at least ONE MONTH before the date of intended registration. No student may register with the Graduate School until his application has been completed and admission has been granted.

Registration of Graduate Students

Graduate students in residence during the spring semester will pre-register for either or both terms of the Summer Session on April 6-9. Other students who have been admitted to the Graduate School should present themselves for registration at the official registration period, June 12 for the first term, and July 19 for the second term. They are required to register both with the Summer Session and the Graduate School.

Graduate students intending to remain in residence during either or both of the two Summer Session terms without registering for course work or research must register for one unit (one semester hour) to cover the cost of medical care and the use of University facilities. This one unit (one semester hour) of registration will entitle students to use the Student Health Service and University facilities during both terms of the Summer Session.

Transfer of Graduate Credits

1) For regulations concerning applying graduate credit earned elsewhere to a graduate program here, consult the *Graduate School Bulletin.*

2) The long-standing reciprocal agreement with the Consolidated University of North Carolina (see *Graduate School Bulletin*) is now effective during the respective Summer Sessions of this University and the University of North Carolina. It is restricted to a graduate student who has registered for a full program during at least one semester of the preceding academic year. Such a student by enrolling in the home Summer Session and paying its normal fees may register for a maximum of 3 semester hours at the other institution upon payment

of a nominal fee of $2.00. Credit so earned is not defined as transfer credit.

The Ph.D. and Ed.D. Degrees

Study for the Ph.D. Degree: Students who are interested in working toward a Ph.D. degree should note in detail the requirements as outlined in the *Bulletin* of the Graduate School of Arts and Sciences. Requirements for the Ph.D. include one academic year of full-time residence.

Study for the Ed.D. Degree: Students who are interested in working toward an Ed.D. degree or for advanced certificates for principals and supervisors should consult the detailed statement in the *Bulletin* of the Graduate School of Arts and Sciences. Requests for specific information regarding residence and programs for the Ed.D. degree should be sent to the Director of Graduate Studies, Department of Education.

Requirements for Master of Arts Degree

Language Requirements: The candidate for the A.M. degree must have a reading knowledge of at least one foreign language. (The several departments reserve the right to specify which foreign languages are acceptable.) The language requirement is met by successfully passing examinations as follows:

a. For French, German, and Russian students admitted in September, 1964 and thereafter take the Educational Testing Service examination given at the Duke University Counseling Center and elsewhere. Students who were admitted before September, 1964 may take either these examinations or the regular reading examination offered by the respective departments.

b. For Spanish the department reading examinations will be taken by all students.

c. For other languages, special examinations must be requested.

Major and Minor Subjects: As a prerequisite to graduate study in his major subject, the student must have completed a *minimum* of 12 semester hours of approved college courses in that subject, and 12 additional semester hours in that subject or in related work. Since some departments have specific requirements for undergraduate preparation, the student should read carefully the special requirements listed by his major department, which are included as headnotes to the course offerings in the *Bulletin* of the Graduate School.

To complete the course requirements for the A.M. degree, the student must take 24 units of graduate courses, of which at least 12

must be in the major subject. Of the remaining 12 he must take 6 units of course work in a minor subject, leaving 6 units of course work to be taken in either the major or minor field, or in another field approved by the major departments and the Dean of the Graduate School. In addition to the course work, the student must present a thesis which carries a credit of 6 units. Thus, the total credit required for the A.M. degree amounts to 30 units.

The Thesis for the Master of Arts Degree: The thesis for the A.M. degree should demonstrate the student's ability to collect, arrange, interpret or report pertinent material on his special research problem. Although a publishable document is not required, the thesis must be written in a literate style, and should exhibit the student's competence in scholarly methods and procedures.

Regulations and Procedures: Students expecting to complete all requirements for a Master's degree should file with the Graduate School office *not less than one month* prior to first presentation of the thesis a declaration of intention to receive the degree and a thesis title. Candidates completing requirements for a Master's degree without thesis should file the same official blank *one month* prior to completion of all degree requirements. Official blanks may be obtained from the Graduate Office or from the Director of Graduate Studies in the student's major department.

Four typewritten copies of the thesis, in the spring binders provided by the Duke University Library, must be submitted, in approved form, to the Dean of the Graduate School at least *three to five days* before the date of the thesis examination. The copies will then be distributed to the several members of the examining committee.

The Examining Committee and the Examination: After consultation with the professor who has directed the thesis work, the Director of Graduate Studies in the major department appoints an examining committee composed of the director of the thesis as chairman and two other members of the graduate faculty, one of whom should represent the minor department. The committee composition is subject to approval by the Dean of the Graduate School. The candidate appears before this committee for an examination, which lasts for about one and one-half hours. The subject matter covered in the examination is usually restricted to the thesis and to the major field.

If the candidate passes his examination, the examining committee certifies to this fact by signing the title page of the ribbon copy and first carbon copy of the thesis. The candidate then returns the original and first carbon copy of the thesis to the Dean of the Graduate School for binding and deposit in the University Library.

Requirements for the Master of Education Degree

Prerequisites: The degree of Master of Education is granted ordinarily only to teachers or to others engaged in educational work.

Before a student is admitted to graduate study for this degree, he should have completed, on the undergraduate level, a minimum of 18 semester hours of approved work in Education.

Requirements for the Degree: The M.Ed. degree may be earned either with or without the presentation of a thesis.

Without Thesis: The required work includes a departmental major (Elementary Education, Administration, Counseling, or Secondary Education) of at least 12 units, and a minor of at least 6 units outside the Department of Education. The remaining 12 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

Toward the end of his residence the student must pass a comprehensive examination on his departmental major. Permission to take such examination must be obtained from the Director of Graduate Studies of the Department of Education, and a notice of intention must be filed with him *at least two weeks* before the announced dates of the examination.

With Thesis: Students who elect this plan are permitted to substitute a thesis for 6 units of the required course work. The thesis subject must be approved by the professor who is to direct it and by the Director of Graduate Studies. Students expecting to complete all requirements for a Master of Education degree should file with the Graduate School Office *not less than one month* prior to first presentation of the thesis a declaration of intention to receive the degree and a thesis title. Official blanks may be obtained from the Graduate Office or from the Director of Graduate Studies in the Department of Education.

In addition to the thesis, the student must present at least 24 units of course credit. Of these, 12 units must be taken in the student's departmental major. Six units, constituting a minor, must be taken outside the Department of Education. The remaining 6 units are elective within the area of Education and the minor field, but require the approval of the student's major adviser and the Director of Graduate Studies.

The regulations concerning the writing and submission of the thesis, and the examination of it, are the same as those governing the thesis for the Master of Arts degree.

The Master of Arts in Teaching Degree

Prerequisites: The degree of Master of Arts in Teaching is designed for teachers already in service and for recent graduates of liberal arts colleges who wish to enter public school teaching.

A student should normally have completed a minimum of 12 semester hours in his proposed major subject and an additional 12 semester hours in that or related subjects. In the event that a student wishes to undertake a graduate major different from the undergraduate major, the prerequisites may be modified upon the recommendation of the student's committee and the approval of the Dean of the Graduate School.

Programs for the Degree: One of two programs may be arranged, in consultation with the student's committee:

A. A major in Education of 18 to 24 units and 6 to 12 units in courses outside the Department of Education.

B. A major in a department other than Education of 18 to 24 units and 6 to 12 units in Education.

In both programs a minimum of 30 units is required.

The non-education courses are to be taken in one or more subjects ordinarily taught in the secondary schools. The amount and distribution of this work will be determined by the needs of the individual student.

The Master of Arts in Teaching may be earned with or without the presentation of a thesis. If a student, in consultation with his committee, elects to present a thesis, 6 units of the total of 30 units required will be allotted to thesis research. He will then be required to complete 24 units of course credits. The regulations concerning the writing and submission of the thesis, and the examination on it, are the same as those governing the thesis for the Master of Arts degree.

Candidates for the Master of Arts in Teaching who have not had teaching experience must major in Education and are required to take Education 215 (or 315) and 216, in which case a minimum of 36 units is required.

The Committee: Each candidate for the degree will be assigned a committee, appointed by the Director of Graduate Studies in his major department, to plan his program of study.

This committee will consist of three members, at least one of whom will be from the Department of Education, and at least one from another department. The chairman of the committee will normally be chosen from the department of the major.

Cooperative Program in Teacher Education

Thirty to thirty-five selected graduates of liberal arts colleges who desire to prepare for high-school teaching will be admitted to a special internship program at Duke University. This program is designed to prepare for a teaching career selected college graduates who did not qualify professionally for teacher certification as undergraduates. The Cooperative Program provides, for candidates who are chosen, graduate study in their special fields, professional courses, and carefully supervised observation and teaching experience. One who completes the program successfully can achieve within a period of fifteen months a year of teaching experience, a Master of Arts in Teaching degree, and full certification as a teacher.

Candidates will begin the program at the opening of the Summer Session of 1965 and complete it in August of 1966. They will spend the summer preceding and the summer following the year of teaching in residence at the University. During the school year 1965-1966 interns will be employed as regular teachers in a cooperating public school system. During this year they will receive full salary and will work under the joint supervision of the cooperating public school and the University. The program will meet training qualifications for the advanced, or graduate, teacher's certificate in many states.

The salary for the year of teaching will, in effect, constitute a substantial award to candidates selected for the program. Interns will benefit from Duke University's special tuition rate for teachers. Applicants will be considered, as are candidates for other awards, on a competitive basis. The best-qualified applicants will be chosen on the basis of undergraduate record, recommendations, and evidence of interest in becoming high-school teachers. Applicants are required to arrange interviews in connection with their applications. Application forms may be secured by addressing a request to the Dean of the Graduate School and must be submitted before February 15, 1965. Details concerning the program can be obtained by writing the Director, Cooperative Program in Teacher Education, Department of Education, Duke University.

Requirements for the Master of Science Degree

Prerequisites: The degree of Master of Science is offered in the fields of Civil, Electrical, and Mechanical Engineering. As prerequisites to this degree the student must have earned a Bachelor's degree from an accredited engineering college and have completed a minimum of 12 semester hours' work in the major field.

Foreign Language: There is no foreign language requirement for this degree.

Major and Minor Subjects: The work for the Master of Science degree is designed to provide a broad basic foundation in the science of Civil, Electrical, or Mechanical Engineering. The student must present acceptable grades for a minimum of 24 units of graduate courses. Of these, at least 12 units must be in the major area. He must also take a minimum of 6 units of minor work outside of engineering and 6 units in the major, minor, or another approved area. In addition to these he must present a thesis, which carries a credit of 6 units. Thus his earned credit for the degree totals a minimum of 30 units.

Regulations and Procedures: The regulations and procedures and the provisions for examination and an examining committee are the same as those for the Master of Arts degree.

Candidacy for the Master's Degree

To be considered as a candidate for a Master's degree (A.M., M.S., M.Ed., M.A.T.) the graduate student must (1) have made passing grades in all courses taken during the first period of residence (if he registers for fewer than 12 units of graduate courses during the first period of residence, he must make passing grades on the initial 12 units of graduate courses), (2) have made a grade of "G" or "E" on at least 3 units of this work, and (3) have received the approval of the major department (or in the case of the M.A.T. of the supervisory committee).

Transfer of Credits

Under certain circumstances a maximum credit of 6 units in a Master's degree program may be allowed for graduate courses completed elsewhere. Approval for the transfer of credits will not be given until the student has spent one semester or two terms in residence. The acceptance of credit up to this amount will not reduce the minimum period of full-time registered residence at Duke University. In no case will credit be allowed for extension or correspondence courses.

With the approval of both the student's major department and the Dean of the Graduate School, a student who is granted such transfer for credit may be permitted to register for as much as 12 units for thesis research instead of the usual 6 units. Or he may be permitted to fill out his schedule with as much as 6 semester hours of further undergraduate training or 6 semester hours of required language courses on the undergraduate level.

Time Limits for Completion of the Master's Degree

The candidate for a Master's degree who is in residence for consecutive academic years should complete all requirements for the degree within two calendar years from the date of his first registration in the Graduate School. Any candidate must complete all requirements within six calendar years of his first registration.

Undergraduate Study

UNDERGRADUATES in Duke University who desire to accelerate their programs may complete the work for a degree in three years by attending two or more summer sessions. By attending both terms of the Summer Session it is possible for a student to earn as many as twelve semester hours of credit. Instruction of interest to undergraduates will be offered in the summer of 1965 in most of the departments and colleges.

Undergraduates from other colleges and universities may enroll for summer instruction at Duke and transfer their earned credits to their own institutions.

School of Nursing

The programs of the School of Nursing include courses in the Summer Session. Persons desiring to enroll in courses to meet the requirements of the School of Nursing programs must be regularly enrolled students. Students who have been admitted with Advanced Standing and who may wish to make up deficiencies in the Summer Session must have courses approved by the School of Nursing. Information about required courses is published in the regular *Bulletin of the School of Nursing*. For further information write to the Dean of the School of Nursing, Hanes House, Duke University, Durham, North Carolina.

Divinity School Studies

BACHELOR OF DIVINITY, MASTER OF THEOLOGY, AND MASTER OF RELIGIOUS EDUCATION: The degrees of Bachelor of Divinity, Master of Theology, and Master of Religious Education are administered by the faculty of the Divinity School. A limited number of courses carrying credits toward these degrees is listed in this *Bulletin* under the heading of Religion. Persons desiring credit toward one of these degrees must be regularly admitted to the Divinity School, and all courses listed for Divinity School credit must be registered and approved in the office of the Divinity School. This school publishes its own Summer Session Bulletin, a copy of which may be secured by addressing The Office of the Dean, The Divinity School, Duke Station, Durham, North Carolina.

Courses of Instruction

Minimum Enrollment Required for Courses

All courses are offered subject to minimum enrollments. The University reserves the right to withdraw undergraduate courses in which fewer than twelve students enroll, senior-graduate courses numbered 200-299 in which fewer than ten students enroll, and graduate courses and seminars numbered 300 or above in which fewer than six students enroll. In withdrawing a course, the University attempts to avoid undue hardships on students. Sometimes, therefore, courses are offered in spite of small enrollments. Courses not listed will be given when a demand develops and an instructor is available.

Department Officers and Regulations

Departments offering Summer Session programs are listed alphabetically. Under each department is given the name of the chairman and the name of the director of graduate studies. Where departments have set up special regulations for admission to candidacy for the Master's degree, these are included.

BOTANY

ASSOCIATE PROFESSOR T. W. JOHNSON, JR., CHAIRMAN—141 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS); PROFESSOR W. D. BILLINGS, DIRECTOR OF GRADUATE STUDIES—142 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS)

Students admitted to candidacy for an advanced degree in botany should have completed a minimum of 12 semester hours of courses in botany (or biology) beyond an elementary course, and related work in biological sciences. Students who have not yet had the minimum hours, however, may enter higher courses by permission of the instructor, if he is convinced that they can carry the work for undergraduate credit, and may count such work toward hours necessary for candidacy.

FIRST TERM (Duke Campus)

225. SPECIAL PROBLEMS.—Hours to be arranged. STAFF

359. RESEARCH.—Hours to be arranged. STAFF

FIRST TERM (Duke Marine Laboratory, Beaufort, North Carolina)

220. COASTAL FIELD BOTANY.—Survey of the regional flora with attention to ecological associations of the Beaufort area. Daily field trips for collection and intensive study study of the rich vascular flora. Prerequisite: One year of college biological science. 6 s.h. WILBUR

225. SPECIAL PROBLEMS.—Hours to be arranged. HUMM AND JOHNSON

359. RESEARCH.—Hours to be arranged. HUMM AND JOHNSON

SECOND TERM (Duke Campus)

226. SPECIAL PROBLEMS.—Hours to be arranged. STAFF

360. RESEARCH.—Hours to be arranged. STAFF

SECOND TERM (Duke Marine Laboratory, Beaufort, North Carolina)

211. MARINE ALGAE.—Classification, taxonomy, morphology, distribution, ecology, and economic uses of marine algae; preparation of herbarium material. In addition to collection, field work will provide students an opportunity to observe associations of marine algae *in situ* by means of diving equipment, if they wish to use it. 6 s.h. SILVA

226. SPECIAL PROBLEMS.—Hours to be arranged. HUMM AND JOHNSON

360. RESEARCH.—Hours to be arranged. HUMM AND JOHNSON

CHEMISTRY

PROFESSOR J. H. SAYLOR, CHAIRMAN—115 CHEMISTRY BUILDING (WEST CAMPUS); PROFESSOR CHARLES K. BRADSHER, DIRECTOR OF GRADUATE STUDIES—124 CHEMISTRY BUILDING (WEST CAMPUS)

All classes in Chemistry, Term I, will begin on June 21 and continue through July 17. All classes in Chemistry, Term II, will begin on July 20 and continue through August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* on page 20 of this *Bulletin*. (Chemistry classes will not meet on Saturdays.)

FIRST TERM

1. GENERAL INORGANIC CHEMISTRY.—Lectures, recitations, and laboratory work on the elementary principles of chemistry and on the occurrence, preparation, properties, and uses of the elements and their compounds. Laboratory daily, 8:30-10:00; recitation daily, 11:00-12:00; lecture daily, 12:00-1:00. 4 s.h. BONK

61. FUNDAMENTALS OF ANALYTICAL CHEMISTRY.—A study of the relations of electrolytes in solution and of chemical equilibrium illustrated by laboratory experiments involving the techniques of gravimetric, volumetric, and colorimetric analysis. Prerequisites: Chemistry 1-2 and Mathematics 21 or equivalent. Lecture or recitation daily, 8:30-10:00; laboratory daily, 10:30-12:30 and 1:30-4:00. 4 s.h. JONES

151. ORGANIC CHEMISTRY.—An introduction to the study of carbon compounds. Compounds of the aliphatic series form the basis of lectures, discussions and laboratory experiments. Prerequisite: Chemistry 61. Recitation daily, 8:00-9:00; laboratory daily, 9:00-12:00; lecture daily, 12:00-1:00. 4 s.h. BROWN

275. THESIS RESEARCH.—Research in the fields of physical, analytical, inorganic, or organic chemistry. Open to those students whose research programs for the A.M. and Ph.D. degrees have been approved by the department and by one of the instructors in charge of the course. Schedule to be arranged. (Not more than one semester hour of credit per week for full-time schedule or one semester hour each two weeks for half-time schedule.) 2 to 8 s.h. Available Terms I and II.

SECOND TERM

2. GENERAL INORGANIC CHEMISTRY.—A continuation of 1. Prerequisite: Chemistry 1. Laboratory daily, 8:30-10:00; recitation daily, 11:00-12:00; lecture daily, 12:00-1:00. 4 s.h. HILL

152. ORGANIC CHEMISTRY.—A study of compounds of the aromatic series and of carbohydrates and proteins. Prerequisite: Chemistry 151. Recitation daily, 8:00-9:00; laboratory daily, 9:00-12:00; lecture daily, 12:00-1:00. 4 s.h. MEYER

CLASSICAL STUDIES

PROFESSOR ROBERT S. ROGERS, CHAIRMAN AND DIRECTOR OF UNDERGRADUATE STUDIES IN LATIN—204 CARR BUILDING (EAST CAMPUS); PROFESSOR JAMES N. TRUESDALE, DIRECTOR OF UNDERGRADUATE STUDIES IN GREEK—105 LANGUAGE BUILDING (WEST CAMPUS)

GREEK

FIRST TERM

121. GREEK LITERATURE: HOMER—*Iliad* and *Odyssey*.—The purpose of this course is to give a general survey of the life and civilization of the Greeks, especially to those who have never studied the language but wish to become acquainted with some of the choicest portions of the literature by the use of translations. The *Iliad* and the *Odyssey* are read in translation, and the excavations and discoveries at Troy and other cities of the Aegean age are discussed. 7:40-9:00. 3 s.h. STANLEY

122. GREEK LITERATURE: THE TRAGIC POETS.—The purpose of this course is similar to that of course 121. Many of the extant plays of Aeschylus, Sophocles, and Euripides are studied in English translations. 9:20-10:40. 3 s.h. STANLEY

LATIN AND ROMAN STUDIES

FIRST TERM

63. CICERO'S ORATIONS.—Selected orations of Cicero are read with attention to prose style. Prerequisite: Latin 1-2, or equivalent. 7:40-9:00. 3 s.h. WOOLEY

64. VERGIL'S AENEID.—Selections are read and interpreted, with due attention to prosody, and discussion of the literary excellence of the work. 11:00-12:20. 3 s.h. WOOLEY

111. ROMAN LITERATURE IN ENGLISH TRANSLATION.—Selected readings of Latin literature in English translation with emphasis on the drama, lyric poetry, and the varied contributions of Cicero to literature. 9:20-10:40. 3 s.h. SETTLE

112. ROMAN LITERATURE IN ENGLISH TRANSLATION.—Selected readings of Latin literature in English translation with emphasis on the epic, the satire, and the novel. 11:00-12:20. 3 s.h. SETTLE

COMPARATIVE LITERATURE

FIRST TERM

205. FOUNDATIONS OF TWENTIETH-CENTURY EUROPEAN LITERATURE.—The roots of the contemporary scene (Proust, Mann, Rilke, Kafka, Eyvind Johnson, Anouilh, Lagerkvist, Camus) evolving toward a mythology of man. 9:20-10:40. 3 s.h. SALINGER

ECONOMICS

PROFESSOR ROBERT S. SMITH, CHAIRMAN—306 SOCIAL SCIENCE BUILDING (WEST CAMPUS); PROFESSOR FREDERICK C. JOERG, DIRECTOR OF UNDERGRADUATE STUDIES—316 SOCIAL SCIENCE BUILDING (WEST CAMPUS); PROFESSOR JOSEPH J. SPENGLER, DIRECTOR OF GRADUATE STUDIES—322 LIBRARY (WEST CAMPUS)

FIRST TERM

51. PRINCIPLES OF ECONOMICS.—A course in the essential principles of economic science. (Credit for Ec. 51 will not be given until Ec. 52 has been completed.) 9:20-10:40. 3 s.h. WALLACE

57. PRINCIPLES OF ACCOUNTING.—Elementary principles of single proprietorship, partnership, and corporation accounting. June 14-June 30. 7:40-12:20. 3 s.h. KEANE

58. PRINCIPLES OF ACCOUNTING.—A continuation of Economics 57. July 1-July 17. 7:40-12:20. 3 s.h. KEANE

138. BUSINESS STATISTICS.—A survey of the principal statistical methods and their application to economics and business administration. The course deals with collection of statistical data, construction of statistical tables and charts, and

a brief study of the fundamental statistical concepts and techniques. 11:00-12:20. 3 s.h. WALLACE

143. CORPORATION FINANCE.—Principles and problems in the financial organization of corporations; the study of corporate securities, the management of capital, the distribution of earnings; industrial combinations; insolvency and reorganization. Prerequisite: Economics 57-58, Principles of Accounting. 9:20-10:40. 3 s.h. JOERG

181. BUSINESS LAW.—The fundamental principles of law as applied to routine business transactions. The topics presented are: contracts, agency, and negotiable instruments: 7:40-9:00. 3 s.h. JOERG

SECOND TERM

52. PRINCIPLES OF ECONOMICS.—A continuation of Economics 51. 9:20-10:40. 3 s.h. NAYLOR

153. MONEY AND BANKING.—The lender's side of financial markets. The activities of commercial banks and other financial institutions in supplying loanable funds and the effects of these activities on the money supply and its rate of use, the impact of central bank and Treasury operations on financial markets, and the evolution of the present monetary system and its institutions. 11:00-12:20. 3 s.h. NAYLOR

286. LATIN AMERICAN ECONOMICS.—A survey of the problems of economic development in twenty countries. 9:20-10:40. 3 s.h. SMITH

EDUCATION

PROFESSOR WILLIAM H. CARTWRIGHT, CHAIRMAN—08D WEST DUKE BUILDING (EAST CAMPUS); PROFESSOR EDWARD C. BOLMEIER, DIRECTOR OF GRADUATE STUDIES—08D WEST DUKE BUILDING (EAST CAMPUS)

Duke University is accredited by the National Council for Accreditation of Teacher Education for the preparation of elementary and secondary school teachers and school service personnel with the Doctor's degree as the highest degree approved.

For admission to candidacy for the Master of Arts (A.M.) degree with major in Education, or for the Master of Education (M.Ed.) degree, students must, in addition to meeting the general requirements for admission to the Graduate School, meet the following specific requirements: Credit for (1) eighteen semester hours of acceptable prior work in Education and (2) twelve semester hours of acceptable prior work in a minor field. If Psychology, Sociology, Economics, or Political Science is chosen for the minor, six semester hours of work completed after entering the junior year in college will be accepted.

The degree of Master of Arts is available in the divisions of School Administration and Supervision, Secondary Education, Elementary Education, and Guidance and Counseling. Every candidate for the Master of Arts degree in the Department should elect at least twelve semester hours in one of these divisions in which he plans to write his thesis and the remainder of his work, including the six semester hours in his minor, with the approval of the proper division adviser. The degree of Master of Education is available in the divisions of School Administration and Supervision, Secondary Education, Elementary Education and the Teaching of Emotionally Disturbed Children. Mr. Bolmeier, Mr. Hurlburt, and Mr. Stumpf are advisers to students in School Administration and Supervision; Mr. Petty, Mr. Sublett and Miss Rudisill are advisers in Elementary Education; Mr. Bolmeier, Mr. Cartwright, Mr. Githens, and Mr. Shuman are advisers in Secondary Education; and Mr. Colver, Mr. Gehman, and Mr. Weitz are advisers in Guidance and Counseling. Mr. Cartwright and Mr. Hurlburt are advisers for the Master of Arts in Teaching program. Candidates for the Master of Arts, Master of Education, or Master of Arts in Teaching degree should read with special care the regulations of the Graduate School as set forth on pages 33-41. Candidates for the Master of Arts in the field of guidance should consult the special brochure on guidance available from the Dean of the Graduate School.

It is the intention of the Department to make available to degree candidates all courses ordinarily required for certification as graduate teachers, counselors, principals and superintendents. These courses will normally be offered at least once every three years.

FIRST TERM

107. ELEMENTARY EDUCATION: ARITHMETIC.—The processes, methods, and materials basic to the teaching of arithmetic in the elementary school. Required in the elementary-education major. (June 17-July 2.) 11:00-12:20 plus Monday and Wednesday, 2:00-4:00. 2 s.h. SANDEFUR AND PETTY

(Persons participating in the Contemporary Mathematics for Elementary Teachers' Workshop will also participate in this course.)

201. TEACHING AND SUPERVISION OF ARITHMETIC.—Special attention is given to the number system, the fundamental operations (with whole numbers, fractions, and decimals), percentage, and measurements. Considered also are the meaning theory, methods of teaching, problem solving, evaluation, practice and drill, and selection and graduation of arithmetical contents. This course is designed for teachers and supervisors in the elementary school. (July 1-July 17.) 11:00-12:20 Monday-Saturday and 2:00-4:00 Tuesday-Thursday. 3 s.h.
PETTY ASSISTED BY SANDEFUR

203. PRINCIPLES OF SCHOOL ADMINISTRATION.—The fundamental facts and procedures of school administration, an analysis of the problems and policies of the organization and direction of a local school system, and the functions of the various school officials. 9:20-10:40. 3 s.h. STUMPF

204. THE SCHOOL AS AN INSTITUTION.—Consideration is given to the place of the school in the American social order, and its adaptation to the social, economic, and political changes. Special attention is directed to the responsibility (1) of the school for seeking solutions to the perplexing problems of youth created by a changing society; and (2) of the government for providing greater equality of educational opportunity. 9:20-10:40. 3 s.h. MARTIN

211. THE PROBLEM CHILD (also Psychology 211).—Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 9:20-10:40. 3 s.h. MRS. GEHMAN

217. THE PSYCHOLOGICAL PRINCIPLES OF EDUCATION.—An advanced study of teaching, learning, and the learner. Selected problems guiding the reading of students will be discussed in class. 11:00-12:20. 3 s.h. GEHMAN

225. THE TEACHING OF HISTORY AND THE SOCIAL STUDIES.—Evaluation of the objectives, content, materials, and methods in the teaching of history and the social studies. 11:00-12:20. 3 s.h. PITTILLO

232. SUPERVISION OF INSTRUCTION.—A survey of supervision as a means of improving instruction and adapting the curriculum to the learner and to community needs. 9:20-10:40. 3 s.h. HURLBURT

243. PERSONALITY DYNAMICS.—A study of personality structure and dynamics with emphasis upon the implications for counseling and instruction. Prerequisite: 6 hours of psychology or educational psychology. 9:20-10:40. 3 s.h. GEHMAN

246. THE TEACHING OF MATHEMATICS.—This course deals with such topics as aims, curriculum, course and lesson planning, and classroom procedure for teaching secondary-school mathematics. (June 14-June 30.) 11:00-12:20, Monday through Saturday and 2:00-3:20, Monday through Friday. 3 s.h. REYNOLDS

253. SCHOOL LAW.—The primary purpose of this course is to familiarize school administrators and teachers with the legal features of school organization and administration. Although some attention is given to constitutional and statutory provisions, the main emphasis is upon court decisions relating to education. Students are expected to select appropriate problems in school law for intensive study. 7:40-9:00. 3 s.h. BOLMEIER

266. SCIENCE IN THE ELEMENTARY SCHOOL.—Presentation of basic concepts in natural and physical science through selected readings, the use of simple experiments and demonstrations, construction and use of equipment, and field studies. (June 21-July 17.) 7:40 daily plus 2:00-4:00 Monday, Wednesday, and Friday. 3 s.h. GITHENS

291. PUBLIC AND COMMUNITY RELATIONS OF SCHOOLS.—A study of the relationship between administrators, professional personnel, non-professional employees, and the entire school or school system and the several publics of the school, especially with those of the community of a given school. Media for interpreting needs and views of the school to the public and vice versa will be explored. The study will apply both to public and private schools. 11:00-12:20. 3 s.h. STUMPF

315. SEMINAR IN SECONDARY-SCHOOL TEACHING.—Advanced level consideration of principles, practices, and problems in secondary-school instruction. Designed particularly to accompany an internship. For students without previous internship credit, this course must be accompanied by Education 216.

315.1 7:40-9:00. 3 s.h. PITTILLO

315.2 7:40-9:00. 3 s.h. HURLBURT

SECOND TERM

213. ELEMENTARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the elementary-school staff. The scope of elementary education is considered to encompass nursery school, kindergarten, and the elementary school. Special treatment is given to the problems of internal organization and management of the elementary school, and its integration with the secondary-school level. 11:00-12:20. 3 s.h. SUBLETT

226. TEACHING READING IN THE ELEMENTARY SCHOOL.—A study of the nature of the reading process and of principles, methods, and materials for the development of effective reading attitudes and skills as applied both to developmental and remedial programs. 9:20-10:40. 3 s.h. RUDISILL

234. SECONDARY-SCHOOL ORGANIZATION AND ADMINISTRATION.—This course is designed especially for principals, teachers, and other prospective members of the secondary-school staff. The scope of secondary education is considered to encompass junior high school, regular high school, senior high, and junior college. Special treatment is given to the problems of internal organization and management. 7:40-9:00. 3 s.h. BOLMEIER

235. THE NATURE, FUNCTION, AND REORGANIZATION OF THE CURRICULUM.—Selected problems guiding the reading of students. 9:20-10:40. 3 s.h. SUBLETT

237. LITERATURE FOR ADOLESCENTS.—This course offers a critical survey of literature written for, or appropriate for, junior and senior high-school students. Fiction, non-fiction, biography, poetry, and drama are examined. Both adult and transition-type literature are considered. Methods of organizing the program in literature are explored. 7:40-9:00. 3 s.h. SHUMAN

238. REMEDIAL READING—PRINCIPLES AND PRACTICE.—A study of the basic causes of reading disability and of principles, methods, and materials for the diagnosis and correction of specific difficulties. The course provides practice with grade-school children suffering reading retardation, including testing, diagnosis, and daily remedial teaching during the six-week period. A basic course in the psychology of teaching of reading is prerequisite, or Education 226 may be taken concurrently. 11:00-12:20. 3 s.h. RUDISILL

239. METHODS AND PROBLEMS OF TEACHING ENGLISH IN SECONDARY SCHOOLS.—This course will present sound methods of teaching the reading of literature and other forms of writing, language, grammar and composition. Materials will include selections found in widely adopted textbooks, numerous specimen themes for grading, and current books and articles in the field. Several short compositions and a report will be required. 9:20-10:40. 3 s.h. SHUMAN

249. INTRODUCTION TO EXCEPTIONAL CHILDREN.—Survey course in special education covering the educational, psychological, medical and social aspects of exceptional children. Field experiences including emotionally disturbed, mentally retarded, neurologically impaired, physically handicapped, crippling and special health conditions, socially and culturally deprived and gifted children. (Opportunities for attendance at psychiatric, psychological, and educational demonstrations with exceptional children.) 7:40-9:00. 3 s.h. STEDMAN

258. EDUCATIONAL MEASUREMENTS.—A critical study of the principles and techniques involved in measurement in education, with opportunity for individual research. Prerequisite: twelve semester hours in the Department, including a course in educational psychology. 11:00-12:20. 3 s.h. COLVER

276. THE TEACHING OF HIGH-SCHOOL SCIENCE.—Discussion, lectures and collateral reading, related to such topics as aims, tests, curriculum, classroom and laboratory procedure, field trips, course and lesson planning for secondary-school science. (July 19-August 14.) 7:40 daily plus 2:00-4:00 Monday, Wednesday, and Friday. 3 s.h. GITHENS

ENGINEERING

PROFESSOR J. L. MERIAM, DEAN OF THE COLLEGE OF ENGINEERING—136 ENGINEERING BUILDING (WEST CAMPUS); PROFESSOR CHARLES R. VAIL, ASSOCIATE DEAN FOR GRADUATE STUDY AND RESEARCH—130 ENGINEERING BUILDING (WEST CAMPUS)

FIRST TERM

C.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydraulic engineering; materials science; structural engineering; or sanitary engineering. Thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

C.E. 365. *ADVANCED TOPICS IN CIVIL ENGINEERING.—Opportunity for study of advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

C.E. 399. *SPECIAL READINGS IN CIVIL ENGINEERING.—Special individual readings in a specific area of study in Civil Engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

E.E. 265. *ADVANCED TOPICS IN ELECTRICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within the Electrical Engineering Department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

E.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under direction of a member of the staff in one of the following fields: dielectric materials; magnetic materials; energy conversion; instrumentation; high voltage phenomena. Master's thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

E.E. 399. *SPECIAL READINGS IN ELECTRICAL ENGINEERING.—Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

M.E. 265. *ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

* Offered only upon sufficient demand; enrollment limited.

M.E. 297, 298. THESIS RESEARCH.—A student with proper background may carry on research under the direction of the staff in one of the following fields: systems engineering; thermodynamics; heat transfer; and fluid flow. Thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

SECOND TERM

C.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under the direction of the staff in one of the following fields: engineering mechanics; foundation engineering; hydraulic engineering; materials science; structural engineering; or sanitary engineering. Thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

C.E. 365. *ADVANCED TOPICS IN CIVIL ENGINEERING.—Opportunity for advanced subjects relating to programs within the Civil Engineering Department tailored to fit the requirements of a small group. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

C.E. 399. *SPECIAL READINGS IN CIVIL ENGINEERING.—Special individual readings in a specific area of study in Civil Engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

E.E. 265. *ADVANCED TOPICS IN ELECTRICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within the Electrical Engineering Department tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

E.E. 297, 298. THESIS RESEARCH.—A student with the proper background may carry on research under direction of a member of the staff in one of the following fields: dielectric materials; magnetic materials; energy conversion; instrumentation; high voltage phenomena. Master's thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

E.E. 399. *SPECIAL READINGS IN ELECTRICAL ENGINEERING.—Special individual readings in a specified area of study in electrical engineering. Prerequisite: approval of the Director of Graduate Studies. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

M.E. 265. *ADVANCED TOPICS IN MECHANICAL ENGINEERING.—Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Prerequisite: approval of the Director of Graduate Studies and of instructor under whom work will be done. 1 to 3 s.h. MEMBERS OF THE GRADUATE STAFF

M.E. 297, 298. THESIS RESEARCH.—A student with proper background may carry on research under the direction of the staff in one of the following fields: systems engineering; thermodynamics; heat transfer; and fluid flow. Thesis credit only. 6 s.h. MEMBERS OF THE GRADUATE STAFF

ENGLISH

PROFESSOR LIONEL STEVENSON, CHAIRMAN—325 ALLEN BUILDING (WEST CAMPUS);
PROFESSOR HOLGER NYGARD, DIRECTOR OF GRADUATE STUDIES—321 ALLEN BUILDING (WEST CAMPUS)

Candidates for the Master's degree in English are expected to have had at least twelve semester hours in undergraduate courses above the sophomore level. The Department may also require additional courses if the work of the student in his first term indicates inadequate preparation.

FIRST TERM

55. REPRESENTATIVE BRITISH WRITERS.—Chaucer's Prologue to *The Canterbury Tales,* and at least two tales, Shakespeare's *I Henry IV, Hamlet,* or

* Offered only upon sufficient demand; enrollment limited.

King Lear, and one other play, John Donne's poetry (selections), and Milton's *Paradise Lost* (selections) and some of the shorter poems. 7:40-9:00. 3 s.h. FERGUSON

57. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works of Poe, Emerson or Thoreau, Hawthorne, Melville, Whitman, Emily Dickinson, and Mark Twain. 9:20-10:40. 3 s.h. DUFFEY

208. HISTORY OF THE ENGLISH LANGUAGE.—A survey of the language from Old to Present English, taking into consideration developments in phonology, morphology, syntax, and vocabulary. 11:00-12:20. 3 s.h. MCGALLIARD

219. THE EIGHTEENTH CENTURY.—Writers studied include Swift, Pope, Defoe, Addison, Steele. 9:20-10:40. 3 s.h. FERGUSON

221. ENGLISH LITERATURE OF THE EARLY NINETEENTH CENTURY.—The Romantic poets and prose writers, 1790-1810, with special attention to Wordsworth, Coleridge, and Scott. 7:40-9:00. 3 s.h. STEVENSON

224. ENGLISH LITERATURE OF THE LATER NINETEENTH CENTURY.—The later Victorian writers, with special attention to Ruskin, Arnold, the Pre-Raphaelites, Swinburne, George Eliot, Meredith, and Pater. 9:20-10:40. 3 s.h. STEVENSON

236. AMERICAN LITERATURE SINCE 1920.—Development of poetry in America from Ezra Pound to the present. 7:40-9:00. 3 s.h. DUFFEY

269. SOUTHERN LITERATURE.—The principal authors studied are Byrd, Kennedy, Simms, Poe, Timrod, and the humorists. Attention is given to the historical and cultural background and to literary relations extending outside the region. 11:00-12:20. 3 s.h. DAVIS

SUMMER INSTITUTE IN ENGLISH

During the first term the Department of English, in conjunction with the North Carolina State Department of Public Instruction, will conduct a Summer Institute for Teachers of English in the secondary schools. The courses in the Institute, listed below, are open to teachers selected for the Institute. For fuller information see page 30 of this *Bulletin*.

291. THE STUDY OF LITERATURE.—Analysis of the genres of literature and the application of the basic methods of critical study. Frequent assignments in writing. 11:00-12:20. 3 s.h. WILLIAMS

292. THE STUDY OF LANGUAGE.—A description of present-day American English from the point of view of modern linguistic theory; comparison of traditional and structural grammars; usage; and the application of language study to composition. 9:20-10:40. 3 s.h. MCGALLIARD

293. THE STUDY OF COMPOSITION.—Through frequent writing assignments and analyses of prose, the course aims at improving the student's writing ability and sharpening his critical judgment of secondary-school and professional writing. 7:40-9:00. 3 s.h. WILLIAMS

SECOND TERM

56. REPRESENTATIVE BRITISH WRITERS.—Novels by Fielding (*Joseph Andrews*), Dickens (*Great Expectations*), and Hardy (*The Mayor of Casterbridge*), and selections from the poetry of Pope, Wordsworth, Keats, and Yeats. 7:40-9:00. 3 s.h. ANDERSON

58. REPRESENTATIVE AMERICAN WRITERS.—Selections and complete works of James, Frost or Robinson, Dreiser, O'Neill, Cummings, and Faulkner or Hemingway. 9:20-10:40. 3 s.h. ANDERSON

239. SHAKESPEARE.—The plays and poems. 9:20-10:40. 3 s.h. BRYANT

251. ENGLISH LITERATURE IN THE SEVENTEENTH CENTURY.—Major works in prose, poetry, and drama, 1600-1660. 7:40-9:00. 3 s.h. WARD

277. ENGLISH PROSE OF THE SIXTEENTH CENTURY.—The development of prose forms and styles from Caxton to Hooker and Bacon. 11:00-12:20. 3 s.h. BRYANT

342. STUDIES IN DRYDEN AND HIS AGE.—The early poems, the important odes, the religious and political poems, selected critical and controversial prose, the heroic play and tragedy. 11:00-12:20. 3 s.h. WARD

FORESTRY

PROFESSOR E. S. HARRAR, DEAN OF THE SCHOOL OF FORESTRY—213 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS); PROFESSOR J. G. YOHO, DIRECTOR OF GRADUATE STUDIES—104 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS)

Organized course work in the School of Forestry during the Summer Session is limited to forest surveying, dendrology, and forest mensuration. These courses are required of all students entering upon two years of study in technical forestry leading to the degree of Master of Forestry.

Qualified students may engage in thesis research in certain branches of forestry during the Summer Session with the approval of the instructor concerned and the Dean of the School of Forestry, or of the Director of Graduate Studies in the case of work taken through the Graduate School.

FIRST TERM

141. DENDROLOGY.—Nomenclature, classification, and identification of woody plants with special reference to species indigenous to southeastern United States and other important forest regions of temperate North America. Laboratory and field studies in the southern Appalachian Mountains, Piedmont Plateau and Atlantic Coastal Plain. Prerequisites: One year of biology including botany. (Three weeks, eight hours a day.) Instruction begins June 14, and continues through July 3. 3 s.h. WHITE

150. FOREST SURVEYING AND AERIAL PHOTO INTERPRETATION.—Application of plane surveying to forest problems, including use and adjustment of instruments; boundary, topographic and cover type surveys; details of land ownership, title, and transfer. Principles of aerial photogrammetry and interpretation of photographs for forest mapping and mensuration. Prerequisites: trigonometry; engineering graphics desirable. (Four weeks, eight hours a day.) Instruction begins July 5, and continues through July 31. 4 s.h. CHAIKEN

SECOND TERM

151. FOREST MENSURATION.—Field studies in methods of measuring content and growth of trees and forest stands; practice in timber estimating, log scaling, use of mensurational instruments, and collection of basic data. (Four weeks, eight hours a day.) Instruction begins on August 2 and continues through August 28. 4 s.h. OSBORNE

357. RESEARCH IN FORESTRY.—Open to students whose research programs for the M.F. or D.F. degree have been approved by the Dean of the School of Forestry and the instructor responsible for directing the research and whose programs for the A.M. or Ph.D. degree have been approved by the Director of Graduate Studies and the instructor in charge. (Credits and schedule to be arranged.) June 12-August 24. 2 to 12 s.h. (Not more than one semester hour of credit per week for full-time schedule or one semester hour each two weeks for half-time schedule.) (Consult courses 301-302 in Announcement of School of Forestry for letter designation of branches of forestry in which research is to be conducted.) STAFF

GEOLOGY

PROFESSOR E. WILLARD BERRY, CHAIRMAN—019 SCIENCE BUILDING (EAST CAMPUS)

The class in Geology, Term I, will begin on June 21 and continue through July 17. The class in Geology, Term II, will begin on July 20 and continue through August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* on page 20 of this *Bulletin*. (Geology classes will not meet on Saturdays.)

FIRST TERM

51. GENERAL GEOLOGY.—This course is designed to give a general view of the surface features of the earth, their origin, structure, and materials. Illustrative materials are studied in the laboratory. Excursions may be made to neighboring points where principles of the science are studied in the field. Lectures or recitations, 8:00-10:30 daily; laboratory, 1:00-4:00. Monday through Thursday. June 21-July 17. 4 s.h. HERON

SECOND TERM

52. GENERAL GEOLOGY.—This course is designed to give some knowledge of the chief events of the earth's history. Excursions may be made to suitable neighboring localities. Lectures or recitations, 8:00-10:30 daily; laboratory, 1:00-4:00. Monday through Thursday. July 20-August 17. 4 s.h. HERON

GERMAN

PROFESSOR HERMAN SALINGER, CHAIRMAN—104 LANGUAGES BUILDING (WEST CAMPUS)

The work in German 1, 2, 63, and 64 will be coordinated with listening and oral practice in the language laboratory which students in German classes will be privileged to attend.

FIRST TERM

1. ELEMENTARY GERMAN.—Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. 11:00-12:20; and on Tuesdays and Fridays, 2:00-3:20. 4 s.h. WILLSON

63. INTERMEDIATE GERMAN.—Grammar review and composition; reading of short stories, novels, and poems. Prerequisite: German 1-2, or two units of high-school German. 9:20-10:40. 3 s.h. WILLSON

64. INTERMEDIATE GERMAN.—Continuation of German 63. Prerequisite: German 63 which may be taken concurrently. 11:00-12:20. 3 s.h. SEYMOUR

GRADUATE READING COURSE.—An intensive course in German to develop rapidly the ability to read technical German in several fields. For graduate students only. 9:20-10:40. No degree credit. SEYMOUR

91. INTRODUCTION TO GERMAN LITERATURE.—A third-year course, toward completion of the language requirement. Readings from representative German authors. Prerequisite: German 64 or equivalent. 9:20-10:40. 2 s.h. ALT

92. INTRODUCTION TO GERMAN LITERATURE.—A continuation of the third-year course, which completes the language requirement. Readings from representative German authors. Prerequisite: German 91 which may be taken concurrently. 11:00-12:20. 2 s.h. ALT

SECOND TERM

2. ELEMENTARY GERMAN.—Practice in understanding, speaking, reading, and writing. Classroom techniques are combined with those of the language laboratory. Prerequisite: German 1 or equivalent. 11:00-12:20; and on Tuesdays and Fridays, 2:00-3:20. 4 s.h. ALT

HEALTH AND PHYSICAL EDUCATION

E. M. CAMERON, DIRECTOR, TRINITY COLLEGE AND COLLEGE OF ENGINEERING—109 GYMNASIUM (WEST CAMPUS)

FIRST TERM

PE 182. THE ADMINISTRATION OF HEALTH AND PHYSICAL EDUCATION IN SECONDARY SCHOOLS.—Presents the everyday problems that arise in the experience of the teacher of health and physical education. Open to juniors and seniors. 11:00-12:20. 3 s.h. HARRISON

PE 190. PROTECTIVE PRACTICES IN PHYSICAL EDUCATION.—Training and conditioning of athletic teams and the prevention, diagnosis, and treatment of athletic injuries. Gymnasium. 7:40-9:00. 3 s.h. CHAMBERS

HISTORY

PROFESSOR RICHARD L. WATSON, JR., CHAIRMAN—235 ALLEN BUILDING (WEST CAMPUS);
PROFESSOR HAROLD T. PARKER, DIRECTOR OF GRADUATE STUDIES—
232 ALLEN BUILDING (WEST CAMPUS)

For admission to candidacy for a Master's degree in History, the student must present a total of twelve semester hours of prior work in History, of which at least six must be in American History if he plans to take his major work in that field. Candidates for the degrees of Master of Arts and Master of Arts in Teaching are required to complete at least three hours of seminar work and are strongly urged to enroll for this work in the second term of their attendance in the Summer Session. (See courses numbered 300 or above.)

FIRST TERM

51. MODERN HISTORY, 1500-1851.—The central fact of the expansion of Europe underlies the content of the course. The chief themes are: the contest between liberty and authority in the modern state, changing economic theory and organization and the problems of peace and war among the states, including the Western infiltration of Asia, Latin America and Africa, and the rise of the United States as a world power. 7:40-9:00. 3 s.h. GINTER

91. THE DEVELOPMENT OF AMERICAN DEMOCRACY TO 1865.—This course is a study of trends vital to an understanding of the United States today. The main theme is the development of American democracy. Problems of foreign policy, the growth of capitalism, political practices, social behavior, and conflicting ideals are considered in relation to this main theme. 7:40-9:00. 3 s.h. MATHEWS

95. ANCIENT HISTORY.—An introductory study of the early history of mankind from preliterate man through the Fall of the Roman Empire. Among the topics considered are the prehistoric tribes, the early cultures of Mesopotamia and Egypt, the religious contribution of the Hebrews, and classical Greece and Rome. 9:20-10:40. 3 s.h. YOUNG

281. TWENTIETH-CENTURY EUROPEAN INTELLECTUAL HISTORY.—An analysis of the more significant aspects of twentieth-century European thought in their historical context. 7:40-9:00. 3 s.h. PFAFF

282. SOCIAL HISTORY OF THE UNITED STATES, 1789-1849.—A study of American society before the Civil War, with special attention to the background, motivation, and development of social criticism and reform. 9:20-10:40. 3 s.h. MATHEWS

295. RECENT INTERPRETATIONS OF ANCIENT AND MEDIEVAL HISTORY.—A course designed to encourage a critical evaluation of major issues and of recent scholarships in ancient and medieval history. 11:00-12:20. 3 s.h. YOUNG

301. SEMINAR IN HISTORICAL INVESTIGATION.—A course designed to introduce teachers, current and prospective, to the processes of historical research through investigation of particular instances. The topics selected for investigation vary with the needs and interests of each individual. 1:40-3:00 or at an hour to be arranged. 3 s.h. FERGUSON

SECOND TERM

52. MODERN HISTORY, 1851-1965.—A continuation of History 51. 7:40-9:00. 3 s.h. CELL

92. THE DEVELOPMENT OF AMERICAN DEMOCRACY, 1865 TO THE PRESENT.—The emphasis is on the emergence of contemporary problems. 7:40-9:00. 3 s.h. WALL

142. CHINA AND JAPAN IN THE TWENTIETH CENTURY.—The history of China and Japan since 1911; the growth of nationalism in China and militarism in Japan. Japan's invasion of China, and the rise to power of the Chinese Communists. 11:00-12:20. 3 s.h. GILLIN

250. SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES.—A history of American thought from 1865 to the present. 7:40-9:00. 3 s.h. MILLER

262. THE SOVIET UNION SINCE 1929.—An analysis of the history, politics, culture, and economy of the Soviet Union under Stalin and Khrushchev. 11:00-12:20. 3 s.h. LERNER

283. COMMUNISM IN MODERN CHINA.—The history of Chinese Communism, from the time of inception in 1919 through its triumph on the Chinese mainland in 1950. 9:20-10:40. 3 s.h. GILLIN

302. SEMINAR IN HISTORICAL INVESTIGATION.—See description of 301. 1:40-3:00 or at an hour to be arranged. 3 s.h. LERNER

HOSPITAL ADMINISTRATION

SECOND TERM

201. HISTORY AND DEVELOPMENT OF HOSPITALS AND OTHER HEALTH AGENCIES.—This course is designed to give the student a broad concept of the health field. It includes a study of the evolution of health institutions; analysis of medical care organizations in the United States, and an introduction to the medical sciences and to medical terminology. 3 s.h. SMITH

MATHEMATICS

PROFESSOR J. J. GERGEN, CHAIRMAN—134 PHYSICS BUILDING (WEST CAMPUS);
PROFESSOR J. H. ROBERTS, DIRECTOR OF GRADUATE STUDIES—
227 PHYSICS BUILDING (WEST CAMPUS)

Graduate students are invited to consult with the Director of Graduate Studies concerning their programs.

FIRST TERM

21. INTRODUCTORY CALCULUS.—Rectangular coordinates, functions, graphs, derivatives, maxima and minima, indefinite integrals, areas. Prerequisite: two and one-half units of college preparatory mathematics. 9:20-10:40. 3 s.h. STAFF

64. INTERMEDIATE CALCULUS.—Infinite series, vectors, and solid analytic geometry, partial derivatives, multiple integrals, introduction to ordinary differential equations. Prerequisite: Mathematics 63. NOTE: This is a three-week course beginning June 14. 7:40-9:00 and 11:00-12:20. 3 s.h. STAFF

221. DIGITAL COMPUTER.—History of computers; number representation, information storage, logical arithmetic; components and organization of computing systems; coding and programming; programmed arithmetics, function and functional subroutines, interpretive routines, compilers; error analysis. A fee of $8.00 to provide for materials and clerical services of the Computing Laboratory is charged for this course. 11:00-12:20. 3 s.h. SMITH

224. STATISTICS.—Elements of mathematical statistics, including a study of probability theory, empirical and theoretical distributions, correlation and regression, sampling, curve-fitting. 9:20-10:40. 3 s.h. BRYSON

SECOND TERM

22. INTRODUCTORY CALCULUS.—Application of the definite integral to distance, volume, length, area of surface of revolution moments, centroids, integration. Prerequisite: Mathematics 21. 9:20-10:40. 3 s.h. STAFF

MATHEMATICS AND SCIENCE INSTITUTE

Only persons who are regular participants in the Summer Science and Mathematics Institute are eligible for these courses, except by special permission from the Director of the Institute.

Botany 205. SURVEY OF MODERN BOTANY I. 3 units (graduate).

Zoology 205. ZOOLOGY FOR TEACHERS. 3 units (graduate).

Botany 235. INTRODUCTION TO FIELD BOTANY. 3 units (graduate).

Botany 236. FIELD BOTANY. 3 units (graduate).

Zoology 225. INTRODUCTION TO FIELD ZOOLOGY. 3 units (graduate).

Zoology 226. FIELD ZOOLOGY. 3 units (graduate).

Mathematics 11. ALGEBRA AND TRIGONOMETRY. 3 units (undergraduate).

Mathematics 21-22. INTRODUCTORY CALCULUS. 6 units (undergraduate).

Mathematics 63. INTERMEDIATE CALCULUS. 3 units (undergraduate).

Mathematics 213-214. MODERN ALGEBRA. 6 units (undergraduate).

Mathematics 216. INTERMEDIATE ANALYSIS. 3 units (undergraduate).

Chemistry 1. INORGANIC CHEMISTRY WITH MATHEMATICS REFRESHER. 3 units (non-credit).

Chemistry 211-212. CHEMISTRY FOR TEACHERS. 6 units (graduate).

Physics 231-232. PHYSICS FOR TEACHERS. 6 units (graduate).

MYCOLOGY

325. MEDICAL MYCOLOGY.—A lecture and laboratory course with emphasis on those fungi which cause disease in man and animals. The course includes practical laboratory work with materials from patients in Duke Hospital and those sent to the Duke Fungus Registry from outside sources. July 5-31. Lecture daily (Monday-Saturday), 8:00-9:00 a.m.; laboratory (Monday-Friday), 9:00-12:00 and 1:30-4:30 p.m.; Saturday 9:00-12:00. 4 s.h. CONANT

NURSING

These courses are open to nurses only, except by special permission from the Dean of the School of Nursing.

N120. PEDIATRIC NURSING.

N130. OBSTETRIC NURSING.

N140. MEDICAL NURSING

N150. SURGICAL NURSING.

N180. PUBLIC HEALTH SCIENCES.

PHILOSOPHY

PROFESSOR CHARLES A. BAYLIS, CHAIRMAN—212 WEST DUKE BUILDING (EAST CAMPUS); PROFESSOR PAUL WELSH, DIRECTOR OF GRADUATE STUDIES—212 WEST DUKE BUILDING (EAST CAMPUS)

FIRST TERM

41. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include, the nature of truth and fact, of evidence, faith and knowledge, and of the fundamental categories descriptive of the universe. 9:20-10:40. 3 s.h. SPECTOR

94. HISTORY OF PHILOSOPHY: ANCIENT AND MODERN.—An introduction to philosophy through the study of some of the major writings of the modern philosophers through Kant. (Open to Freshmen with a B average.) 11:00-12:20. 3 s.h. SPECTOR

SECOND TERM

42. KNOWLEDGE, FACT, AND VALUE.—An introduction to philosophy through the study of some of its main problems. These include the nature and ground of values, ultimate goals, and moral obligation. 9:20-10:40. 3 s.h. BINKLEY

93. HISTORY OF PHILOSOPHY: ANCIENT AND MODERN.—An introduction to philosophy through the study of some of the major writings of the ancient Greek philosophers. (Open to Freshmen with a B average.) 11:00-12:20. 3 s.h, BINKLEY

PHYSICS

PROFESSOR HENRY A. FAIRBANK, CHAIRMAN—119 PHYSICS BUILDING (WEST CAMPUS)

Classes in Physics 41, Term I, will begin on June 21 and continue through July 17. Classes in Physics 42, Term II, will begin on July 20 and continue through

August 17. Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* on page 20 of this *Bulletin*. (Physics classes will not meet on Saturdays.)

FIRST TERM

41. GENERAL PHYSICS.—This course treats the basic principles of general physics in a more quantitative manner than Physics 1-2. It meets in a thorough way the physics requirement for entrance into the study of either medicine or engineering, and is well suited for the general science student. This course is not open for credit for students who have completed Physics 1-2. Lecture and recitation daily, 8:30-9:50 and 10:10-11:30; laboratory four days per week, 1:00-4:00. Prerequisites: Mathematics 21, 22 or equivalent. 4 s.h. HOPKINS AND CARPENTER

353X. THESIS SEMINAR.—Students who are properly qualified may carry on research work under direction. Credits and hours to be arranged. STAFF

SECOND TERM

42. GENERAL PHYSICS.—A continuation of Physics 41. Prerequisite: Physics 41. Lecture and recitation daily, 8:30-9:50 and 10:10-11:30; laboratory four days per week, 1:00-4:00. 4 s.h. HOPKINS AND CARPENTER

POLITICAL SCIENCE

PROFESSOR JOHN H. HALLOWELL, CHAIRMAN—307 LIBRARY (WEST CAMPUS); PROFESSOR ALLAN P. SINDLER, DIRECTOR OF GRADUATE STUDIES—306 LIBRARY (WEST CAMPUS); PROFESSOR HUGH M. HALL, DIRECTOR OF UNDERGRADUATE STUDIES—315 LIBRARY (WEST CAMPUS)

FIRST TERM

61. THE AMERICAN POLITICAL SYSTEM.—An analysis of the principles and institutions of government and politics in the United States. 11:00-12:20. 3 s.h. SIMPSON

125. AMERICAN POLITICAL PARTIES AND PRACTICAL POLITICS.—A study of the historical development, organization, and methods of political parties in the United States. 7:40-9:00. 3 s.h. SIMPSON

SECOND TERM

62. COMPARATIVE POLITICAL SYSTEMS.—An analysis of the principles and institutions of selected foreign governments, as compared with those of the United States. 11:00-12:20. 3 s.h. WILLIAMSON

229. RECENT AND CONTEMPORARY POLITICAL THEORY.—The rise of positivism and its impact upon modern political thought, the origins of socialism, Marxism and its variants, socialism in the Soviet Union, nationalism, Fascism and National Socialism, the crisis in modern democracy, Christianity and the social order. 9:20-10:40. 3 s.h. WILLIAMSON

PSYCHOLOGY

PROFESSOR IRVING E. ALEXANDER, ACTING CHAIRMAN—240 BUILDING 9; PROFESSOR NORMAN GUTTMAN, DIRECTOR OF GRADUATE STUDIES—103 BUILDING 9

Details concerning the program in studies in Psychology may be obtained from the Director of Graduate Studies in Psychology.

FIRST TERM

91. INTRODUCTORY PSYCHOLOGY.—An introduction to the facts, principles, and problems of psychology through a study of motivation, emotions, perception, sensation, thinking, memory, learning, social behavior, individual differences, and personality. 7:40-9:00. 3 s.h. CARSON

211. THE PROBLEM CHILD (Also Education 211).—Study of problem behavior and adjustment in children with emphasis on the causes and treatment of conduct

and neurotic disorders of the maladjusted child. Particular attention will be paid to mental hygiene principles in the handling of problem children in school and home. 9:20-10:40. 3 s.h. MRS. GEHMAN

232. PERSONALITY AND PHYSICAL HANDICAP.—Survey of the psychological factors underlying adjustment to physical disabilities, with particular stress upon personality, emotional and social attributes. Selected case studies will be used to illustrate the integration of such factors in adjusting to home, school, and hospital settings. These cases will stress the psychological factors which hinder learning and retraining procedures. Discussion will center about psychological techniques to produce more effective progress in rehabilitation. 7:40-9:00. 3 s.h. MRS. HUSE

303. RESEARCH.—Students who are properly qualified may carry on research work under direction. Hours and credit to be arranged. STAFF

SECOND TERM

100. PERSONALITY.—Representative theories of personality, from Freud to the present, emphasizing problems of normal personality structure, dynamics, development, and assessment. 9:20-10:40. 3 s.h. GREENWALD

304. RESEARCH.—Students who are properly qualified may carry on research work under direction. Hours and credit to be arranged. STAFF

RELIGION

PROFESSOR ROBERT E. CUSHMAN, DEAN OF THE DIVINITY SCHOOL—124 DIVINITY SCHOOL (WEST CAMPUS); PROFESSOR JAMES L. PRICE, CHAIRMAN OF THE DEPARTMENT OF RELIGION—117 DIVINITY (WEST CAMPUS); ASSISTANT PROFESSOR W. D. WHITE, DIRECTOR OF UNDERGRADUATE STUDIES IN RELIGION—117 DIVINITY (WEST CAMPUS); PROFESSOR WALDO BEACH, DIRECTOR OF GRADUATE STUDIES IN RELIGION—209 DIVINITY (WEST CAMPUS)

THE DEPARTMENT OF RELIGION

FIRST TERM

51. THE ENGLISH BIBLE.—A survey of the Old Testament, similar to Religion 1 but adapted to the capabilities of sophomores, juniors, and seniors. Not open to freshmen, or to students who have received credit for Religion 1. 7:40-9:00. 3 s.h. WINTERMUTE

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen, or to students who have received credit for Religion 1-2 or 51-52. 9:20-10:40. 3 s.h. WINTERMUTE

85. INTRODUCTION TO CHRISTIAN ETHICS.—An analysis of the Biblical and theological bases for an understanding of man's moral situation, with a study of the social implications of Christianity in selected problem areas. Prerequisite: Religion 55 or equivalent. 11:00-12:20. 3 s.h. MCCOLLOUGH

140. CHRISTIAN BELIEFS.—An introductory study of important Christian teachings concerning God, Jesus Christ, sin and salvation, etc., intended to serve as a basis for the student's evaluation of his own religious concepts. 9:20-10:40. 3 s.h. LANGFORD

189. MAN IN MODERN PROPHETIC THOUGHT.—The individual and society in the writings of Kierkegaard, Nietzsche, and Berdyaev. 7:40-9:00. 3 s.h. MCCOLLOUGH

SECOND TERM

52. THE ENGLISH BIBLE.—A survey of the New Testament, similar to Religion 2 but adapted to the capabilities of sophomores, juniors, and seniors. Not

open to freshmen, or to students who have received credit for Religion 2. 7:40-9:00. 3 s.h. PHILLIPS

55. THE RELIGION OF THE BIBLE.—An introduction to the historical and critical study of the Old and New Testaments, which considers the principal persons, events, ideas, and practices contained in the Biblical record, and their significance for the present time. Not open to freshmen or to students who have received credit for Religion 1-2 or 51-52. 7:40-9:00. 3 s.h. PARTIN

93. SURVEY OF THE WORLD'S LIVING RELIGIONS.—An introductory course designed to acquaint the student with the problems and methods of the study of world religions. After a brief consideration of religion in primitive culture, the world's living religions are dealt with in terms of historical development and beliefs, practices, and contemporary importance of each. Prerequisite: Religion 55 or equivalent. 9:20-10:40. 3 s.h. PARTIN

156. CHRISTIAN MARRIAGE AND THE FAMILY.—Marriage and the family in American society studied from the Christian perspective. Attention will be given to the teachings of the churches and of psychologists and sociologists concerning courtship and marriage, sex, parent-child relationships, mixed marriages, and divorce. 11:00-12:20. 3 s.h. PHILLIPS

THE DIVINITY SCHOOL

Class enrollments will be controlled as occasion may arise so as to secure a fairly even distribution among the courses offered in each term.

FIRST TERM

115 (DS). MORAL THEOLOGY IN THE TWENTIETH CENTURY.—Critical and comparative examination of ethical theory as exhibited in the work of William Temple and selected contemporary theologians. 11:00-12:20. 3 s.h. HARMON SMITH

195 (DS). ORIGINS OF DOGMATIC THOUGHT.—An analysis of dogmatic concepts in the Gospel of John: their development into a body of doctrine. 7:40-9:00. 3 s.h. HERZOG

261. THE THEOLOGY OF JOHN WESLEY.—A study of the development and structure of Wesley's theology, with special reference to his doctrines of man and salvation. 9:20-10:40. 3 s.h. RICHEY

SECOND TERM

16 (DS). CONTEMPORARY WESTERN CULTURE.—An analysis of the conceptual commitments in contemporary styles of thought and life as reflected in the natural sciences, philosophy, social analysis, and the arts. 9:20-10:40. 3 s.h. POTEAT

140 (DS). THE RISE OF METHODISM AND THE ANGLICAN BACKGROUND.—The Methodist societies within the Church of England to the death of Wesley. Prerequisite: C.H. 13-14. 11:00-12:20. 3 s.h. BAKER

170 (DS). INTRODUCTION TO PASTORAL COUNSELING.—The philosophy and techniques of formal counseling through discussions of textual and interview material. Prerequisite: P.C. 26. 7:40-9:00. 3 s.h. GOODLING

ROMANCE LANGUAGES

PROFESSOR JOHN FEIN, CHAIRMAN—205 BUILDING 5

FRENCH

FIRST TERM

1. ELEMENTARY FRENCH.—Introduction to understanding, speaking, and writing French. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. TERRY

63. INTERMEDIATE FRENCH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: French 1-2 or two years of high-school French. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. GOODE

SECOND TERM

2. ELEMENTARY FRENCH.—Continuation of 1. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. NAJAM

64. INTERMEDIATE FRENCH.—Continuation of 63. 9:20-10:40 and Tuesdays and Fridays 3:00-4:20. 4 s.h. NAJAM

210. FRENCH PHONETICS.—The phonemic structure of contemporary French. Sounds, intonation. Practice in transcription. Remedial pronunciation drills. Readings on current phonological theory, especially as applied to French. 9:20-10:40. 3 s.h. HULL

242. FRENCH LITERATURE AND THOUGHT IN THE AGE OF ENLIGHTENMENT.—The crisis in literary aesthetics. Readings, lectures, and discussions bearing on the clash between Classicism and new literary orientations. 11:00-12:20. 3 s.h. CHERPACK

SPANISH

FIRST TERM

1. ELEMENTARY SPANISH.—Introduction to understanding, speaking and writing Spanish. Audio-lingual techniques are combined with required recording-listening practice in the language laboratory. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. FLINT

63. INTERMEDIATE SPANISH.—Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisite: Spanish 1-2 or two years of high-school Spanish. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. TORRÉ

SECOND TERM

2. ELEMENTARY SPANISH.—Continuation of 1. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. SIEBER

64. INTERMEDIATE SPANISH.—Continuation of 63. 7:40-9:00 and Mondays and Thursdays 2:00-3:20. 4 s.h. TER HORST

SOCIOLOGY AND ANTHROPOLOGY

PROFESSOR JOHN C. MCKINNEY, CHAIRMAN—268 BUILDING 9 (WEST CAMPUS);
PROFESSOR ALAN C. KERCKHOFF, DIRECTOR OF GRADUATE STUDIES—
268 BUILDING 9 (WEST CAMPUS)

The Department of Sociology offers graduate work leading to the A.M. and Ph.D. degrees. Before undertaking advanced work in this department, a student must have completed a minimum of twelve semester hours of approved preliminary courses in the field, and twelve additional semester hours in the field or in related work. A student who is deficient in the minimum required work will be asked to take additional undergraduate courses agreed upon in conference with the Director of Graduate Studies.

Candidates for advanced degrees in Sociology usually take minor work in Psychology, Economics, Political Science, Education, History, or Religion. Detailed requirements for the minor work, and for majors in other departments who wish to present Sociology as minor work, may be obtained from the Director of Graduate Studies.

FIRST TERM

91. INTRODUCTION TO SOCIOLOGY: CONCEPTS AND PROCEDURES.—Concepts and procedures of sociology and illustrations of their use in understanding specific areas of social life. Open to freshmen. 11:00-12:20. 3 s.h. MRS. WHITRIDGE

154. THE SOCIOLOGY OF THE ARTS.—An analysis of the social relations of the world of the arts (painting and sculpture, music, and literature) with emphasis upon creative artists, art publics, art organizations and art works as they function in their social-cultural milieux. 9:20-10:40. 3 s.h. MRS. WHITRIDGE

247. COMMUNITY AND SOCIETY.—This course seeks to provide a frame of reference for the analysis and ordering of facts pertaining to the diverse cultures of the world, the State, the world community, the Great Society, news, mass behavior, social problems, races and classes. 9:20-10:40. 3 s.h. THOMPSON

255. RACE AND CULTURE.—A comparative study of race relations in world perspective developed around such themes as races and personal identity, the geography and ecology of race relations, the idea of race, and race conflict. 11:00-12:20. 3 s.h. THOMPSON

SECOND TERM

92. INTRODUCTION TO SOCIOLOGY: SOCIOLOGICAL STUDIES.—Application of theories and methods of sociology through an examination of several empirical studies dealing with various aspects of social behavior. 11:00-12:20. 3 s.h. ROY

242. THE SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS.—The social significance of work. Analysis of forces changing the contemporary occupational structure, typical career patterns of professions and occupations, the social organization of occupational groups. 9:20-10:40. 3 s.h. ROY

ZOOLOGY

PROFESSOR EDWARD C. HORN, CHAIRMAN—227 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS); ASSOCIATE PROFESSOR D. A. LIVINGSTONE, DIRECTOR OF GRADUATE STUDIES—043 BIOLOGICAL SCIENCES BUILDING (WEST CAMPUS)

All classes in Zoology are offered at the Duke University Marine Laboratory at Beaufort, North Carolina (Term I, June 12-July 17; Term II, July 19-August 24). Students who wish to avoid paying a late registration fee must have their registration completed in advance of these dates. For registration dates see *General Registration* page 20 of this *Bulletin*. For detailed instructions and further information on these offerings see the *Bulletin of Duke University Marine Laboratory*.

To undertake study toward an advanced degree in Zoology, a student should have completed an undergraduate major in Zoology or its equivalent. This normally amounts to twenty-four or more hours of course work distributed among various fields of Zoology. The department recognizes the trend in modern biology towards interdisciplinary research, and part of the Zoology requirements may be replaced by advanced work in Chemistry, Mathematics, Physics, etc.

Required work for the A.M. degree ordinarily includes twelve units of advanced course work in Zoology, six units of course work in a minor department, and an additional six units of advanced course work in the major or minor department, or in other pertinent departments. Furthermore, an acceptable thesis is necessary for the fulfillment of the degree requirements.

Candidates for the Ph.D. degree are expected to be broadly trained zoologists. The program of each candidate is determined by a committee which reviews previous training and sets the specific requirements to be made. Normally the program includes graduate courses in several fields of Zoology, courses in the minor subject, wide reading in science in general and in biology in particular, research, and dissertation based on original work. Minor work is available in many fields, including Anatomy, Biochemistry, Botany, Chemistry, Physics, Physiology and Psychology.

FIRST TERM (Duke Campus)

353. RESEARCH.—Hours to be arranged. 2-6 s.h. STAFF

FIRST TERM (Duke Marine Laboratory)

203. MARINE ECOLOGY.—A study of marine animals in relation to environment. Consideration of environmental factors, succession, rhythms, communities,

intraspecific and interspecific relations, productivity, conservation problems, etc., concerned with animal life in the ocean. Lectures, reviews, conferences, field and laboratory work. 6 s.h. GRAY

250. PHYSIOLOGICAL ECOLOGY OF MARINE ANIMALS.—A study of the physiological responses of marine animals in relation to certain environmental factors and evolution. Animals representing numerous phyla and from various habitats are studied. Prerequisite: Zoology 151 or equivalent. 6 s.h. ROBERTS

353. RESEARCH.—Hours to be arranged. 2-6 s.h. STAFF

SECOND TERM (Duke Campus)

353. RESEARCH.—Hours to be arranged. 2-6 s.h. STAFF

SECOND TERM (Duke Marine Laboratory)

215. GENERAL PHYSICAL AND CHEMICAL OCEANOGRAPHY.—Relief of the ocean floor; physical and chemical properties of sea water; distribution of temperature, salinity, and density; heat budget; sea ice; light; ocean currents, waves and tides; selected topics of regional oceanography. Field work, processing and analyzing of routine oceanographical data, solving problems and interpretation of results. Prerequisites: One year of physics and chemistry, mathematics through calculus. 6 s.h. STEFANSSON

274. MARINE INVERTEBRATE ZOOLOGY.—A study of invertebrate animals that occur in the Beaufort region. A number of field trips will be made to a variety of habitats to study, collect, and classify animals in their natural environment. The structure and habits of living invertebrates, as well as their behavior under certain experimental conditions, will be studied in the laboratory. 6 s.h. BARNES

353. RESEARCH.—Hours to be arranged. 2-6 s.h. STAFF

Alumni Organizations

GENERAL ALUMNI ASSOCIATION: The Alumni Association of Duke University is composed of the former students of Duke University and its predecessor, Trinity College. The Association has its annual dinner at Commencement, at which time the annual business meeting of the Association is held.

DUKE UNIVERSITY NATIONAL COUNCIL: The Duke University National Council is a working body for the alumni interests and maintains a constant supervision of alumni activities. It devotes its activities and efforts to advancing the welfare of Duke University by all appropriate means. Two meetings are held each year, one at Commencement and the other in the fall. The Council is composed of representatives from the various classes, local associations, students, faculty, parents, representatives at large, honorary members, officers of the General Alumni and Alumnae Associations, and representatives from the alumni and alumnae organizations of the professional schools.

GENERAL ALUMNAE ASSOCIATION: The Alumnae Association of Duke University, a division of the Duke University Alumni Association, is composed of the women graduates and former students of Duke University and its predecessor, Trinity College. The annual business meeting is held on Alumnae Day.

ALUMNAE COUNCIL: The Alumnae Council was established by the General Alumnae Association in 1925. As the working organization of the group which established it, the Council endeavors to bind more closely the alumnae and the University and to advance the interests and aims of Duke University.

THE ALUMNI OFFICE: The General Alumni Office was organized to promote the work of the local alumni and alumnae associations and to co-ordinate the various activities of the General Alumni and Alumnae Associations and the Duke University National Council and Alumnae Council. One hundred local and professional alumni associations have been formed throughout the United States.

THE ALUMNI REGISTER OF DUKE UNIVERSITY: *The Alumni Register* of Duke University is a magazine published ten months of the year by the Alumni Association in the interest of the alumni and the University. It aims to keep the alumni in touch with one another and with the University.

THE ALUMNI NEWS: *The Duke University Alumni News* is sent to all alumni four times during the year.

Bureau of Public Information

The Bureau of Public Information is the official news agency of the University, and all University news except sports, emanates from this office. The Bureau maintains the University's relationship with the press and other communications media, and interprets the University —its faculty, its research and its academic achievements—to the public via these media.

The Bureau also maintains individual biographical files on all faculty members, students and staff, as well as files on all University departments and activities. Its files of clippings form a rich source of historical information of the Institution's life. In addition, the Bureau is a source of information for the many inquiries about Duke University which are received daily from all sections of the nation and from abroad.

Gifts and Bequests

DUKE University derives its principal support from endowment funds and from miscellaneous gifts and grants. Permanently invested capital funds enable the University to offer to students academic and professional training at a fraction of its actual cost. The effectiveness of the University is determined to a large extent by its financial resources.

Gifts and bequests devoted to the improvement of the work of the University will be received and administered by the trustees in accordance with the desires of the donor.

GIFTS. Any kind of property, real or personal, may be the subject of a gift and only such form as is required to pass title is necessary. If the gift consists of real property, the title will be passed by deed; if it consists of cash or unregistered bonds, the gift is consummated by delivery of the property; or if stocks, by delivery of properly endorsed stock certificates. Unless restricted, the use of gifts is at the discretion of the Board of Trustees. Usually the proceeds, conservatively invested, are added to the permanent endowment of the University. The donor may, however, restrict the use of any gift and designate definitely the objects for which it shall be used. In such

cases, the transfer of property would be accomplished by a letter or other documents describing in detail the objects for which the proceeds of the gift are to be used and when accepted by the University the term or conditions set out therein becomes binding upon it.

BEQUESTS. Bequests may be made to the University by an appropriate clause inserted in a will by codicil to a will already drawn. The following forms will serve as appropriate clauses for wills or codicils:

GENERAL

I give (devise; if real property) and bequeath to Duke University, a corporation existing under the laws of the State of North Carolina and located in the City and County of Durham, State of North Carolina, and its successors forever, the sum of.....dollars (or otherwise describe the gift) for the general purposes and uses of the University at the discretion of the Board of Trustees.

SPECIFIC

I give (devise; if real property) and bequeath to Duke University, a corporation existing under the laws of the State of North Carolina and located in the City and County of Durham, State of North Carolina, or its successors forever, the sum of.....dollars (or otherwise describe gift) and direct that the income therefrom shall be used for the following purposes, viz. (here describe the use desired).

CODICIL

Having hereinbefore made my last Will and Testament dated..... ....., and being of sound mind, I hereby make, publish, and declare the following codicil thereto; (here insert clause in same form as if it had been included in body of Will). Except as hereinbefore change, I hereby ratify, confirm, and republish my said last Will and Testament.

Degrees and Honors

The following degrees were awarded June 7, 1965:

BACHELOR OF ARTS

Clifford S. Adams
Patricia Lee Adams
James Kenneth Adlam, Jr.
Arnold Lorentz Ahnfeldt, Jr.
Barbara Jan Albers
John Graves Aldridge
Margaret Bothwell Allen
C. Robert Anderson
Thomas Jerome Anderson
Craig Neal Andrews
Lucile Jamison Anutta
Susan Elizabeth Appleton
Ronald Lee Arenson
Walter E. Bachman, III
Alice Sheppard Badgett
George James Baer
Judith Ann Baker
Susannah Carlin Baker
Barbara Balderston
Lawrence Kirk Banks
Wendell Phillips Blagden Banks
Ronald Mills Barbee
Stephen Patterson Barnes
Elizabeth Anne Barnett
Kenneth Carrington Bass, III
Nicholas Smith Battelle
Bruce Richard Baumgartner
Edna Grace Bay
Guy Anthony Bayes
Frederick Alexander Beasley
Carl E. Beimfohr
Sarah Ellen Bell
Virginia Douglas Bell
Albert Edward Benjamin, Jr.
Lucinda Moore Benjamin
Ann Louise Bennett
Bruce Rittenhouse Bennett
Diane Carol Bennett
John H. Bennett
Linda Ruth Bergquist
James Louis Bierfeld
Jane Elizabeth Black
William Raymond Blackard, Jr.
Sarah Virginia Boll
Juanita Mae Bost
Richard Neal Boswell
Dana Clarke Bottcher
John Karl Bouman
Mary Brantley Boyd
Sandra Kay Boyles
Benjamin Franklin Bracy, III
Barbara Alice Brading
Patricia Mary Bradsher
Ernest Jackson Branscomb, Jr.
Roy Stanley Bredder
John Edwards Brewster, Jr.
Jane Lang Brian
Kenneth Sterling Bridgeman
Howard Walter Brill
Charles Irving Brooks
Donald Bradley Brooks
Diane Elizabeth Brown
Harold Clifford Brown, Jr.
Nancy Sunderland Brown
Tempe Curry Brownell
Barbara Sue Brummett
Robert Thomas Buchanan
Judith Ullenberg Buhrman
Gail Merrell Burgess
Rebecca Sue Burgess
David Lawrence Burke
Judith Kaye Burns
Jeanne Drost Burwell
Reynold Laurence Caleen, Jr.
William Andrew Caltagirone
Betty Sue Cameron
Donald Curtis Cameron
Anita Carol Campbell
Ruth Hallock Campbell
James Spence Caraway
Gary Russell Carden
Susan Carithers
Edwin A. Carlson, Jr.
Edith Patricia Carr
Dorothy Constance Carroll
Stephen George Carver
Leon Franklin Cashwell, Jr.
Truman Rose Castle
Betsy Kathryn Caudle
Mary Ann Cavanagh
Josephine Reynolds Chambers
Jack H. T. Chang
Russell Chapman
Robert Lee Cheatham
Jon Bruce Weston Clarke
Kenneth J. Claro
Geraldine Ann Cohoe
Wesley Louis Coker
Andrew E. Colclough
John Peter Coll, Jr.
Sandra Mary Collins
Judith Conn
Carl Edward Conrad
Karen Maureen Cooey
Barbara Ellen Cook
Betty Phillips Cooper
Lee Lewis Corbin
Thomas Cosgrove
Susan Elizabeth Cotterill
James Edwin Covington
Florence Allene Cowan
Donald Winston Creaves
Laney Tilson Credle
John H. Creech
Dwight Phelps Cruikshank, IV
James Lawson Curry
Carolyn Jane Cutchin
Gary Lee Davenport

Noël Davidson
Anne Elizabeth Davis
Grace Moore Davis
Robert Errol Davis
Grayce Bieg Dawson
Thomas Roszelle Dawson
Susan Pepper Deckert
Kent Swindell Denton
Eugene Francis Deutscher
Robert Gwyn Dillon
Cathy Lewis Dilworth
Susan Kay Dittmar
Susan Hendry Dobson
John Charles Doelle
Maurine Doggett
Barbara JoAnn Downing
Larry J. Doyle
Leanora Ann Dreisinger
Clyde Stephen Dula
Susan Gary Duncan
Joseph C. Dunlap
Ernest Lloyd Dunn
Catherine Bradsher Dunnagan
Sylvia Faye Eakes
Kent Cline Earnhardt
William King Easley
William Everette Eason, Jr.
Alan Walter Eckert
Olivia Root Edmonson
Charles Cannon Edwards
Mary Ann Edwards
Ursula Margaret Ehrhardt
John Albert Elias
Loellen Kay English
Linda Elise Erickson
Roger Carl Erickson
Mary Lucille Ernst
Karen Joy Esslinger
Lynn Etheridge
Orinda Dale Evans
Thomas S. Evans
Judith Ewell
Barbara Ann Ferguson
Dennis H. Ferguson
William Preston Few
Doloris Ann Fincher
Carl Ellis Fisher
Judith Ann Weingarth Fox
Patrick B. Fox
Stephen Douglas Fox
Martha Dillard Franck
Rebecca Joan Frank
Edith Anne Fraser
Henry Louis Freund, Jr.
Susan Widstrom Gamelin
Kenneth MacNair Gammill
Gilbert Lawrence Gates, Jr.
Thomas Schley Gatewood, Jr.
Carol Louise Gegauff
George Michael Gibbons
William Henry Gibbons
Norman Thomas Gibson
*Sara Jean Gillespie
Herbert Bates Gillies
Margaret Ann Gilliland
Karen Jeanne Gittings
Eleanor Clara Gohdes
Caroline Lewis Gram
Michael Proctor Graney
Wesley Bennett Grant
William R. Grant
Michael S. Greenly
Roger Kent Greenwood
Elizabeth Boswell Greig
Deanna R. Grim
Mayer Irwin Grnber
Brenda Ann Gupton
Clem Maurice Hall
Sandra Elizabeth Hall
Sara Elizabeth Hall
Martha Frances Hamilton
Roger Clark Hamilton
John Edward Hanna
Mary Howard Harding
Haines Hilsman Hargrett, Jr.
Harry Williams Harper
Wilmer Milton Harper
Charles Marcus Harris
John Weiss Harris
Judith Hoyt Harris
Joyce Harrold
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Charles Tucker Helmes, Jr.
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Mary Shepard Henderson
Julia Alice Hensley
Anne Elizabeth Herbert
Chesley Carlisle Herbert, III
Ronald William Herbster
Thomas James Herin
Allan Pitner Hess
Richard Mason Hess
William Richard Heugh
Wenonah Celeste Heyl
Rebecca Thompson Hill
Douglas Paul Hinds
Jacqueline Hoffman
Joan Hoffman
Frankie Huitt Hollar
Stephen Michael Holloway
Helene Solovioff Holmes
Robert A. Holt
Merilyn Ann Hoover
Beverly Colvin Hopkins
Betty Jane Horton
William Colton Hough, Jr.
Peter Schuyler Houseknecht
Kenneth Walton Hubbard
William Hill Hudson, III
William James Hudson, Jr.
Patricia Jane Hughes
William Franklin Hughes, III
Myron Craig Hulen
Charles Jerome Huneycutt, Jr.
Janet Taylor Huntley
Alice Acton Ingram
Franklin Wade Ingram
Ann Louise Jackson
Arthur Francis Jacobsen
Robert James Jamieson
Benita Burton Jankle
Clara Watters Jaspert
Frances Carol Jennings
Clint Clarinda Jennison
Carroll L. Joachimi, Jr.
Albert Foster Johnson
*Elizabeth Pittman Johnson
James Richard Johnson
Jerry Mychyle Johnson
Sallie Elizabeth Johnston
Barbara-Jean Ross Jones
Robert Richard Jordan
Patricia Mary Kasmar
James M. Kellogg
Mary Elizabeth Kelly
Frances White Kelts
David Douglas Kerman
Robert David Kimball
Gail Edith Kinard
Caleb Jewette King, III
Richard Hartwick King
Noel J. Kinnamon
Barbara Jean Kirk
Patrick Bruce Kirwan
James Jacob Kiser, III

John Summerell Kitchin
Brent Gordon Kitching
Otto Cobb Kitsinger, II
James Sidney Kitterman, Jr.
Harold Klesmer
Rosine Marie Koningsberger
Paula L. Kozicki
Karalyn Krasin
Susan Emily Kraybill
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Evelyn Jeannine Krueger
Lee Allan Kuntz
Camille Kurtz
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Mildred Anne Lassiter
Eleanor Sue Latimer
Claude Andrews LaVarre, Jr.
William Grove Lawyer, II
Margaret Pennell Leahy
Margaret Leanne LeCompte
Charles Ralph Lewellen
Robert John Lifton
Herbert Daniel Litaker
Barbara Janet Livingston
William Curtis Livingston, III
Ann Elizabeth Loflin
Edgar Sevier Lotspeich, III
Catherine Jane Reeve Love
Heather Jane Low
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Richard Best Lowe
Thomas A. Lowery
Michael Leo Lowry
Karen Wiman Luce
Ronald Lewis Ludwig
Jay Lanier Lukins
Carl Francis Lyon, Jr.
Henry John MacDonald, Jr.
Ann Elizabeth Mace
Charles Newell MacLane
Ralph Emerson Mann, II
*Joanna Sibley Martin
Mary Bynum Martin
Patricia Lee Mathews
Gerald Arthur Mattson
James Patrick Mauney
Jane Meredith Maxwell
Robert Elliott McBride
Frederick Anthony McCarthy
James Vincent McCarthy
Jane Robinson McCleary
Diana Cecelia McConnel
Ann McNally
Ellis Emily Meeker
Thomas F. Melchior
Mary Case Mellencamp
Charles Reid Melton
James Jack Metropol
Alan Howard Meyer
Bernard Whitehead Midgett
Andrew Charles Miga
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Christie Poppenheim Miller
Christopher Glendon Miller
Grayson Brownlee Miller, Jr.
John Meredith Miller, Jr.
Mary Melinda Miller
Alan L. Minard
Lawrence Glenn Misenheimer, Jr.
John Wayne Mitchell, Jr.
Perry Bedell Mitchell
Walter Goos Moeling, IV
Dan Cockrill Moore
Fred Henry Moore
Merry Dawn Moore
Nancy Lee Moore
Richard Horton Moore
William Guerrant Moorefield, Jr.
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John Edward Morris, III
Amy Morrison
Robert Lee Moser, Jr.
Beverly Jean Moss
John David Moss, Jr.
Richard Hyatt Mossburg
Patricia Pecor Motch
Robert Joseph Mueller
Richard Sprague Murlless
Nancy McIntosh Murray
Marcia Rebecca Myers
Mary Burckel Nada
Sherif Amin Nada
Ronald Neufeld
Stephen Pape Newstedt
Barbara Lillian Newton
Regina Gertrude Norcross
Richard Allen Norton
Jon Martin Nottingham
Carolyn Suzanne Odom
John Robert Ogden
Alexander John Ogrinz, III
Marjorie Ann O'Neall
Linda Orr
Margaret Alice Osborne
Carol Baldwin Papps
John Jackson Parker
Leighton Brown Parker, Jr.
Linda Warren Parks
Robert J. Passantino
James Thayer Pate, Jr.
Camilla Norton Patrick
Josephine Patterson
Michael Scott Patterson
Sylvia Faith Patterson
Robert James Patton, Jr.
Margaret Katherine Pauley
Ann Florence Pauly
Susan Jane Pauly
Arthur William Peabody, Jr.
Marilyn Jeanne Peak
James Rutledge Peake, III
Vaughn Craig Pearson
Robert Douglas Penick
Kenneth Perrine
Susan Lapsley Persons
Michael I. Peterson
Anna May Pickrell
Ann Tonnelier Pilgram
Mary Ann Plant
Mary Ellen Plumer
James Edward Pollard
Stephen Tullis Porter
Shirley Ann Powell
Willis Warren Powell, III
Marilyn Ellis Powers
Stephen Pressfield
Ellen Martha Pressman
Paul Baker Pritchard, III
Pamela LeRoy Pugh
William Elgin Pursley, Jr.
Ann Louise Quattlebaum
Susan Janet Rackelman
Sarah Helen Ramsey
Rush McClure Rankin, Jr.
Ray Edmond Ratliff, Jr.
Robert Brian Reagan
Judith Ann Rector
Sidney W. Reid, Jr.
James Andrew Reiffel
John Franklin Reiger
Richard Vladimir Remigailo
Anne Kathryn Reynolds
Leon Leftwich Rice, III
Maryann Ricketts
Joseph Douwe Rienstra
Mary Dyer Robb

Jane Turney Robbins
Linda Gambill Roberts
William Albert Roberts
Sandra Jean Robinson
Judith Leslie Rodrigues
Becky Ann Rogers
Dilworth Thomas Rogers, Jr.
Linda Sue Rogers
William F. Rogers
John Michael Rollert
Overman Randolph Rollins
Thomas Lee Romp
Marcia Moore Ross
Susannah Marguerite Roy
Ben Richard Rudisill, II
John Austin Ryan, Jr.
*Emilia Alice Saint-Amand
William Cary Sammons
David Edward Sandlin
William Earl Sasser, Jr.
Susan Patterson Schad
Sally Anne Schlesinger
Frederick Loomis Schultz, Jr.
Sally Ann Schumacher
Dennes Leigh Searles
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Robert Lyndon Simpson, Jr.
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John Andy Smith, III
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Patricia Gray Smith
Sandra Glynn Smith
Susan Elizabeth Smith
Walter Aldine Smith, Jr.
Carol Jean Southmayd
John Calloway Spencer
Herbert Duane Steele
Ann Lyn Stephens
Charles Garon Stephens
Monica Lynne Stevenson
Thomas Paul Stitt
Margaret Priscilla Stone
Pamela Anne Stover
William Christian Strackbein
William Franklin Strickland
John Burke Stroud
John Lawrence Sullivan, III
Ruth Marion Sutch
Lamar Marie Swain
Daniel Marion Sweger
John Jorg Tarpley
Mary Carol Tarpley
Lois MePhail Tart
Joe Todd Taylor, III
Rebecca Johnston Taylor
Catherine Anne Teets
Nancy Lloyd Temple
Sara Kathryn Thomasson
June Williams Thornton
Larry Edward Tise
R. Haskell Tison, Jr.
Jane Wallace Titus
William Miller Todd
Robert Kent Trickey
Mall Tuul
Alexander Bruce Umstead, Jr.
John Garrett Underhill, III
Herbert Jackson Upchurch, Jr.
Kathryn Ann Vale
Milton Spangler Van Hoy
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Marlin Milton Volz, Jr.
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John Philip Waggoner, III
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You Lue Wang
Stanley Sidney Ward
Jonathan Francis Warner
Patricia Waterman
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Wendy Patricia Watson
Sarah Lynn Weaver
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Jon Weingarten
John Bolling Weisiger
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Karen Collins West
Charles Edward Westerman, Jr.
Jimmie David Westmoreland
John Law Wheeler
Charles Denny White, Jr.
Thomas Stuart White, Jr.
Lynda Carole Whitley
Robert Sterling Wiggins, Jr.
Ann Malloy Williams
Donald Williams
Mary Frances Williams
Joseph Edward Williamson
Donald George Wilson
Mary Pittman Wilson
Wayne Richards Wilson
Elizabeth Winstead
Arthur Michael Winston
Alethea Stewart Wise
Jane Catherine Witherspoon
*Mary Kathryn Woodruff
Judy Jo Worley
Craig Winston Worthington
Josh Bob Worthington
Albert Victor Wray, III
Harold Everett Wright
Carl Frederick Yaeger, II
Virginia Ileen Yarbrough
Mary Hart Young
Güler F. Yücel
Thomas Michael Zavelson
Gwendolyn Ann Zbikowski
Ruth Carolyn Zlotowitz

BACHELOR OF SCIENCE

Donald Lancy Allyn
Alan Douglas Berry
Barbara Ann Blohm
Larry Richard Brannock
William Ashworth Burslem, Jr.
Robert David Carlitz
Linda Lorraine Coleman
Henry David Connor
Lila Carol Corn
Susan Hipson Cornwell
Marshall Robert Crosby
Robert Elmo Denton
Robert Wayne Dutton
John Michael Dye
John Marcus Eckerd
John Charles Edlin
Charles Randall Edwards
Alexis Epanchin
Alice Holland Estes
Laura Virginia Faulkner
Rita Carol Fisher
Charles Stephen Foster
Robert Thomas Graybeal
Richard Arnold Gunter
Hubert Taylor Gurley
Davis Addison Hays
Hugh Littell Henry
Doren Willard Hess, Jr.
Herbert Morrison Hill
Jacques Richard Houyoux

Doris Anne Ingram
Betty Ruth Johnson
James McAndrew Jones, Jr.
Ralph Walter Jones, Jr.
Hugo Arnold Keesing
Sandra Clay Kerbow
Irene Vertna Gulledge Lopp
Donald Marger
Marshall Duer McDorman, Jr.
Lawrence Everett Miller, Jr.
Alexander Cochran Montgomery, III
Ardean Carol Moore
Samuel Maxwell Myers, Jr.
William H. Olson
Franklin Elliott Peters
Charles Alan Pilcher
Jeffrey Wayne Place
Ray Caldwell Purdom
Elizabeth Wilson Randall
Linda Sue Rhodes
Hugh Burgess Robinson, Jr.
Vernon Dodds Rowe, III
Charlotte Rundles
Richard Dewey Sharpe
James Richard Sidbury
James Russell Sites
Heather Howard Smith
Louis Bert St. Petery, Jr.
David L. Valle
Carol Emily Van de Ree
Ronald James Vaughan
Edmond Brady Williams, Jr.
William Wilson Young, Jr.
Richard Earl Youngstrom

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

John Alfred Abbott, III
Ralph Edward Brown
Robert Clarke Campbell
Alfred Tawresey Duncan
Edward Wilmott Fishback, Jr.
John R. Gabriel
Eugene Armand Garand, Jr.
Louis R. Hagood, III
William Albert Keim
George Paul Kelley
John Clinton McClain, Jr.
Ward Robinson Scull, III
Joseph Stephen Simon
William Anderson Simpson
Michael Lee Tewell, Jr.
Henry Otto Uhden, Jr.
Michael Sherman Walsh, Jr.
Charles Thomas Wright, Jr.

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Edward Forrest Baird
Paul Frederick Brown, Jr.
E. Evans Cayce, Jr.
Douglas Mason Clark
Richard F. Clark
Douglas Adrian Cotter
William Freddie Cromartie
Waynelee Ellis Davis, Jr.
Ronald Brita Falciani
George Horace Flowers, III
Richard Andrew Frazer
James R. Gnuse
John B. Goody
Norman Charles Grant
Rein Haus
Robert Earl Haygood
William Charles Johnsen
Richard Goddard Kelts
Paul Vernon Kirby
Irving William Lanier
C. Blake McDowell, III
Joseph Neely McIntire
Walter Cade Metz, Jr.
James McNeill Archer Parsley
Wayne Terryl Peterson
William Sloan Plumer, Jr.
Thomas Owen Price
James Ross Scuffham, Jr.
Terry Allen Simpson
Philip Kin-lok So
Thomas Victor Treptow
William Thomas Warren
Richard Byrd Woods, Jr.

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Raymond Van Ashmun, Jr.
Thomas Cornell Berry, Jr.
Richard Allen Best
Robert Lendon Brantley
Andrew Lynn Burgess, Jr.
William Wesley Charlwood
Joseph H. Cox, Jr.
Peter Beardsley Crist
Thomas Franklin Culbreth, III
Robert Bruce Graham
Quincy Barham Hocutt
Robert Phillip Hubbard
Thomas Pinckney Lanning
David William Minnotte
Elton F. Motch, Jr.
Lyman F. Narten, II
E. Lindsay Potter, III
Robert Ramsey Reed
Lowell Scott Salter, Jr.
Stephen W. Snyder
Ted Warren Steele
Joel Bartlett Stevens, III
Neil Evans Turner
John Franklin Walden
Michael Olson Wheeler

BACHELOR OF SCIENCE IN NURSING

Jo Ann Appleyard
Alice Jean Bailey
Barbara Barclay Bertrand
Elizabeth Kennedy Caldwell
Virginia Deborah Cardona
Gayle Peach Ceder
Carole Annette Chamblee
Gertrude Linda Clay
Cathryn Anne Cordyack
Phyllis Jean Crothers
Carol Ann Davis
Elizabeth Clare Disco
Deborah Donkin
Susan Margaret Dusbabek
Margo Kellow Evans
Elsie Edith Farnham
Sharon Carla Stetzer Ferlic
Barbara Joan Fesmier
Beverly Hitchcock Flint
Nancy Dianne Furste

Susan Elizabeth Guest
Jenifer Gummey
Susan Elizabeth Handy
Barbara Jeanne Heusner
Elaine Louise Hydeman
Nancy Jane Hyre
Barbara Kay Johnson
Alice Corbly Kern
Cheryl Elaine Kinsley
Virginia Ann Kliner
Gail Ann Malevan LeBauer
Mary Caroline Lewis
Helen Sparks Luly
Barbara Ruth Lundholm
Tharon Cecile McConnell
Virginia Allison McGee
Margaret Susan Minier
Hettie Garland Nagel
Dorothy Louise Newton
Lynn Page
Lois Harriet Parker
Gail Melinda Peterson
Margaret Lang Rastall
Carol Brisbane Rinehart
Martha Eleen Robertson
Mary Alyce Searles
Mildred Anderson Shailer
Robin Elizabeth Shumway
Judith Ann Simmons
Mary Katherine Smith
Melinda Free Smyth
Margaret Lynn Hagaman Sullivan
Susan Swatzburg
Norma Lee Todd

MASTER OF SCIENCE IN NURSING

Nancy Walker Anderson
Jane Arlene Bailey
Winifred Reeves Bennett
Gladys Carleton Clarke
Doris I. Hughes
Mary Lee Sanders Kirkland
Dorothy Lillian Merrow

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Von McLoyd Baldwin
Bobby Mac Berry
Chang Chen
Frank Joseph Fredericks
Hugh Lee Fuller
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David Edward Miller
Norman Lee Owsley
Surendra Kumar Saxena
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Dorothea Louise Bell
Armand Leo Bellavance
Carol Williams Bilbro
Diane Marie Disney
Roberta Humphrey Elkins
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Darwin Richard Harrold
Robert Allison Maxwell
John Dane Moorhead
Wendy Tonkin Moorhead
Edward Lee Roberson
Margo Drakou Rorer

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Ruth Mandac Arichea
Dorathy Mae Chance
Joan Allen Sanders
Ottalee Smith Winegar

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Ann St. Clair Ragsdale Baker
Robert E. Comas
Judith May O'Neil

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Marvin Clark Fultz
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Ralph T. Monahan, Jr.
Harry W. Mussell, Jr.
William E. Pleines
Richard Luther Rex
Carl William Rust
Richard Creighton Seale
David Martin Stack
Stephen James Suor
Rudolf Christiaan Tarumingkeng
John Lexleigh Turnbull
Jeffrey L. Wartluft
Robert N. Weirich
John Pierce Wenrich
Joseph Woodford West, Jr.
Phil C. Woolwine
Thomas Ernest Wooten

MASTER OF HOSPITAL ADMINISTRATION

John Bland Burkhardt, Jr.
Judson Nathan DeBra, Jr.
John Lee Gibbons
Robert Russell Hafner, III
Floyd Lynn Hair
Stanley Floyd Lowrey
Elbert Magee Marcom
John Field Montgomery, Jr.
George Charles Phillips, Jr.
Kenneth R. Spoon

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Adrienne Susan Adler
Christa Altenstetter
Thomas William Anderson
William Arfin
Thomas Atteridge, III
Paul Dean Atwell
Norma Marie Blackburn
William James Breen
James Hugh Broussard
Richard Burnham
Robert Jasper Cain
Heather Turner Coughlan
Joseph Ralph Cowart
Noel Dorman
Susan Jane Dunkel
Patricia Bailey Edmondson
Felisa Dumlao Fernandez
Germán A. Blanco Fernández
Jonathan David Fraley, Jr.
Mark Christo Frangiadakis
Doris Jean Franks
Timothy Robert Gamelin
Barrie Keith Gilbert
Louise Gundry Grant
Joan A. Gratz
Becky Jon Hayward
Carl Hirsch
Philip Duane Holmes
Mary Lou Kohfeldt Hoye
Asrar Husain
Joan Hutcheson
Eldon Lewis Jones
Elaine Mozer Kauvar
Harvard Vaughan Knowles
Amos Lee Laine
Linda Susan Lucas
William Saunders Maltby
Margaret L. Mann
Ronald Ely Marcello
Myra Kathryn Martin
Walter Jeffries Matherly
Donald Ray McAdams
Lawrence Richard McCloskey
Ann Louise Molleson
Helen Ruth Blair Moore
John Ellery Munzenrider
Nasiruddin
Jean Elizabeth Inglis Nebel
Ronald R. Nelson
Alden Bryan Pearson, Jr.
John Louis Pierce
George I. Rand
Mary Hertenstein Rhoades
Margaret Weatherly Richards
Ann Fiser Richman
Jay Thomas Roe
Benjamin Houston Romine, Jr.
Charles Dudley Salley
Sandra Frederick Seeber
Frank Amfort Shelburne
Howard Everett Shook, Jr.
Elizabeth Ann Smith
Thomas Calvin Smith
Patricia Louise Stutts
Jimmie Ray Suttle
Lucile Ann Tate
Lyon Gardiner Tyler, Jr.
John L. Washburn
Winona Louise Webber
Henry Otto Wefing, Jr.
Kenneth Bruce Weiner
Hiromasa Yonekura

BACHELOR OF DIVINITY

Kenneth Paul Ambrose
C. Clifford Attkisson, Jr.
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James H. Charlesworth
Jerry O'Neil Cook
Lloyd Thomas Cunningham
Thomas Carroll Daily
Linden W. Damschroder
John Paul Davenport
Hubert Trevelyan Davis
Joe Cliff Davis
John M. Dorsey
Denis Chandraraj Dutton
Ralph Hill Eanes, Jr.
Daniel Thomas Earnhardt
Donald Peyton Fortenberry
Daniel P. Freitas
Lloyd Edward Griffith, Jr.
James Allen Hewett
Hubert Sydney Huggins
Harold Benjamin Jayroe
Myung Johng Kim
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Eugene H. Lovell, Jr.
Harold L. May
Ervin Thomas Murphy, Jr.
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Carl Edward Settle
John William Setzer, Jr.
John Lawrence Sharpe, III
Charles Michael Smith
William Monroe Spake, Jr.
Yugo Suzuki
Marion Milton Swann
James E. Taggart
James Snell Underwood, Jr.
Robert Louis Wallace
Herman N. Ward, Jr.
Johnnie J. Williams, Jr.
Arthur John Wilson, III
Edward E. Woodall, Jr.
Louis Herman Woodard
Matthew Augustus Zimmerman, Jr.

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David Finger Addlestone
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Joseph James Brigati
Michael G. Briggs
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Reginald Eugene Burleigh
Charles G. Campbell
Randle Burt Carpenter, Jr.
Thomas Crawley Cartwright
Thomas Bennett Clark
D. David Cohen

Patrick Campbell Coughlan
David Kerry Crenshaw
William Midwood Curtis
Gerald Donald Dansby
Robert Evans Detweiler
Robert Allan Edgar
Thomas Andrew Edmonds
Paul Revere Ervin, Jr.
Samuel Wolcott Farr
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John Miller Hines
David C. Hjelmfelt
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Thomas Cushing Kleinschmidt
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William Henry Lear
David Louis Lougee
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Emil Carl Marquardt, Jr.
Eric Francis Matthies
Raymond A. McGeary
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Constantine Nicholas Revelos
J. David Ross
John Jacob Rufe
Ronald G. Seeber
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Ross Jordan Smyth
George William Speer, III
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Ward Barker Stevenson, Jr.
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Carter Heston Strickland
Robert Lee Toms
Edan Gabriel Unterman
Richard Hamilton Vincent
Craig B. Ward
Joseph Warren, III
Wade Thomas Watson
Fred Alvah Windover, II
Robert Edward Young

DOCTOR OF MEDICINE

Mary Teresa Repole Andriola
Michael John Andriola
Bernie Ballington Baker, Sr.
John Young Barbee, Jr.
William Raymond Bender
Darell Doty Bigner
Stephen Christopher Boone
Edward Hecht Bossen
Gene Allen Butcher
Suzanne Amelia Ralston Butcher
Louis Anthony Cancellaro
Arthur Gaspar Cavallaro
Thomas Parks Clancy
Frederick Vernon Coville
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Robert Gwinn Crummie
Anthony Joseph Di Croce
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Herman Kalman Gold
David Samuel Goldman
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Snowden Cowman Hall, III
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Robert Eugene McArtor
Joseph Dean McCracken
Frank Hamilton McGregor, Jr
Joseph Sheppard Minus
Guy Leary Odom
Martin M. Oken
Aglaia Nikides O'Quinn
John Gary Powell
Andrew Richard Price
Kenneth Paul Ramming
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James Peter Reitt
Charles Parker Riley
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W. Samuel Yancy
Joseph Patrick Zaepfel
Sara Kay Shilling Zirkle

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Douglass W. Gilbert
Sheldon Elliot Hermanson
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Ronald Alva Koonts
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Chrysostom Manuel
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Frank Caston Perry
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Gordon LeRoy Roth
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R. Taylor Scott
John L. Spain, Jr.
Clark A. Thompson
Clay H. Turner
Ichiro Yamauchi

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Gary Melvin Hipps
Arthur Edward Justice, Sr.
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Jesse Louie McDaniel
J. David Mohler
Clyde Alfred Parker
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Earl Wilton Sandefur
Dan Stuart Thompson
Bob M. Thornton
Harold Latham Tyer
Elonza McKinley West, Jr.

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Franklin Thomson Bonner
James Henry Brown, Jr.
Robert Rodney Foil
David Marion Moehring

DOCTOR OF PHILOSOPHY

Peter Herbert Allen
Harvey Gene Anderson
Daniel Castillo Arichea, Jr.
Khwaja Muhammed Sultanul Aziz
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Derek John Cash
Alphonse Ralph Cavaliere
John Whitson Cell
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Herbert Collins
Eugene Carson Crawford, Jr.
James Carroll Crosthwaite
Leslie Clement Duly
Clyde Augustus Fasick
Luis A. Feliu-Otero
William Randall Fowler, Jr.
Robert Dutton Fray
George Harold Gadbois, Jr.
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Bruce David Grossman
Carleton Sanborn Guptill
David George Hale
William Frank Halloran
Kenneth Gerald Hampton
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James Alfred Hart
John Heintz
Dallas Milton High
Peter William Hochachka
Bruce Willard Hodgins
Caroline Tobia Holloway
Robert W. Holmstrom, Jr.
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Robison Brown James
Houston Gwynne Jones
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Richard Michael Kelly
John William Kilgore
Abraham David Kriegel
Robert Vincent Kubicek
Ping-Wen Kuohung
Delmar Frederick Lohr, Jr.
Michael Stephen Patrick Lucas
Louis Henry Manarin
Gary Leroy Maris
James Joseph McLeskey, III
Korandattil Venugopalan Menon
Don Curtis Miller
Kenneth Edward Miller
William Jerome Mitchell
Larry King Monteith
Roger Lyman Morehouse
Evelyn F. Murphy
Stanley Alan Nicholson
Peter Perchemlides
Gus A Petitt
John Franklin Piper, Jr.
Henry Powell Porter, Jr.
Brenda L. Pruden
Elizabeth L. Pugh
Allen Laverne Rebuck
Kenneth Morton Reshaur
Jonathan Lynde Richardson
John Stephen Roberts
David Paul Roselle
Gilbert Lionel Rutman
Robert Paul Schultz
John Schoneberg Setzer
Fuad Sha'ban
Robert N. Shorter
Pinckney Alston Steiner, III
Harshad Rai Thacore
Philip Joseph Traci
John Dean Turner
Jerry Eugene Vaughan
Sidney Edwin Veazey
Robert Edward Webster
David Eugene Whisnant
Kevin Joseph White
Philip L. Whitney
Leon Edward Winslow
Jimmie J. Wortman
Mary Farris Zinn

COMMISSIONS IN THE UNITED STATES NAVY AND THE UNITED STATES MARINE CORPS

Ensign, United States Navy

Edward Forrest Baird
Andrew Lynn Burgess, Jr.
Jon Bruce Clarke
Robert Elmo Denton
Robert Bruce Graham
Jacques Richard Houyoux
Lawrence Everett Miller, Jr.
Alan Lester Minard
Alexander John Ogrinz, III
John Jackson Parker
Jimmie David Westmoreland
Charles Thomas Wright, Jr.
Harold Everett Wright
William Wilson Young, Jr.

Ensign, United States Naval Reserve

Nicholas Smith Battelle
Frederick Alexander Beasley
William Raymond Blackard, Jr.
David Lawrence Burke
Leon Franklin Cashwell, Jr.
Carl Edward Conrad
Thomas Joseph Cosgrove
Robert Wayne Dutton
Ronald Brita Falciani
Eugene Armand Garand
Carroll Liggett Joachimi, Jr.
George Paul Kelley
Phillips Gibbs LaMotte
Claude Andrews LaVarre, Jr.
Richard Hyatt Mossburg
Stephen Wilson Snyder
John Burke Stroud
Alexander Bruce Umstead, Jr.
Jonathan Francis Warner

Second Lieutenant, United States Marine Corps Reserve

Carl Edward Beimfohr
Reynold Laurence Caleen, Jr.
Donald Curtis Cameron
Eugene Francis Deutscher

COMMISSION OF SECOND LIEUTENANT, UNITED STATES AIR FORCE

Thomas Franklin Culbreth, III
John Michael Dye
James R. Gnuse
Charles Jerome Huneycutt, Jr.
Christopher Glendon Miller
Alexander Cochran Montgomery, III
Robert Lee Moser, Jr.
John David Moss, Jr.
James Thayer Pate, Jr.
Terry Allen Simpson

DEGREES AWARDED SEPTEMBER 1, 1964

BACHELOR OF ARTS

Susan Hill Blount
Thirwall William Bonham
Heath Claiborne Boyer
Robert L. Boyett
Barbara Cordes Bulow
Adrianne Bacon Burk
Mary Jane Altvater Caison
Susan Louise Chandler
Neil Edward Churchill
Carlynne Carter Comas
Louis Ludford Davenport, III
Daniel Diaz
Joseph Patton Driessen
Jenny Rose Ellis
Ransom Wooten Etheridge
Stanford S. Fader
Bart Fredo
Jimmy Ray Fuqua
Marilyn Joyce Gillen
Koleen Alice Haire
Nancy Sloan Ingram
Robert Wesley Johnson
Diana Adele Jones
Ted Richard Kunstling
William John Kurtz
David Owen Lucas
James Vann May
Charles Patterson McCausland, III
Marilyn Elaine Meadors
Ray Hunting Misner, III
Fouad Mohammed Moughrabi
Richard Joseph Ney
Roy Allen Padgett, Jr.
Richard Adams Powell
Joseph Cowan Ramage
James H. Register
Charles H. Richman
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Frances Ann Smith
Pamela Powers Sun
Milton Johnson Underwood
Richard Allen Vance
Richard Stanley Webb, Jr.
Joan Condit Weber
David LeRoy West
Judith Woodburn

BACHELOR OF SCIENCE

Gayle Edwin Michael

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

William Richard Helms, II
John Jay Sullivan

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Khalil Ali Hakim

MASTER OF SCIENCE

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Rudolf Carl Werner Dankwort
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Jean-Pierre Georges Le Floch
James Wallace Hooker
William Keith Owens

MASTER OF ARTS IN TEACHING

Fred Lawrence Adair
Jonathan Edwards Adams, Jr.
George Lynn Albert
Robert Brown Ambrose
Frances Ann Bailey
Beverly Barker
James Frederick Barrett
Sybil Jean Beasley
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Joseph Wasbington Bland, Jr.
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Lewis Turner Farmer, Jr.
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Barbara Marie Grey
Cbarles Edwin Grigsby
Heather Adele Hall
Ronald Keith Hampton
Edgar Perry Hicks
Donna Elaine Houff
Elizabeth Girault Jones
William Daniel Kelly
Margaret Overton Kelso
Dania Kos
Mary Ann Lea
Robert Brent Linblad
Norman Locksley
Joe Ed Manry
Coy Edwin McClintock
William Davis Owen
Phyllis Ann Peterson
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Kathleen Priest
Lamar Cecil Ratcliffe
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Christine Anita Schillinger
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Christine Lowenbach Sbore
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Martba Ellen Walker
Frederick George Wild
Angela Williams
Edward Joseph Wiltrakis
Ann V. Witten

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Betty Best Britt
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Eleanor Allen Harris
Dan Atlas Jones
Janet Elaine Leeb
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Janice Robbins Sedgwick
Barbara Lee Wilburn

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Fred Chappell
Ricbard Allen Cox
James Allen Crisp, Jr.
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John Alan English
Ann Sullivan Gravatt
R. Frederic Hafer
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Randall Rich Kincaid, Jr.
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Bettie Opal Moretz
Joan Pierce Newman
Sally Sapp Olson
Hyland Bryant Packard, Jr.
James Norman Porter, Jr.
William Warren Reinhardt
Theodcre Frederick Rocbow
Arlyne Naphtali Snyder
Paul Clayton Summitt
Paul Hughes Templet
Albert Blythe Turner
Parma Westbury Tuten
Robert Meredith Watson, Jr.
Rebecca Anne White
Fred C. Wilbur
Cbarles Hill Yarborough, Jr.

DOCTOR OF MEDICINE

David William Martin, Jr.

DOCTOR OF EDUCATION

Robert Ross Byrd

David William Rogers, Sr.

DOCTOR OF PHILOSOPHY

John Darrell Bashaw
Rajendra Sahai Bhatnagar
Stephen Christopher Boone
John Strickland Boyer
Jesse H. Brown
Bernard A. Bulos
Miles Aubrey Crenshaw
William Hoyt Dantzler
Eugene C. Drozdowski
John Reid Hauser
Thomas Sidney Katman
Robert David Kaylor
William Francis Keirce
George Henri La Roi
John Rodgers Moroney, Jr.
James Carlton Randall
Clark G. Reynolds
Prem Parkash Sehgal
Henry Otto Stone, Jr.
Max Keith Sutton
Michael Daniel True
Barbara Lee Huberman Weinberg
Charles Talmadge Wellborn
Bruce Richard Wenner
John Charles White
Paul Frederick Wohlford
John Edward Woodham

JUNE 7, 1965

Summa cum laude

Stanley Sidney Ward
Caroline Lewis Gram
Kenneth Carrington Bass, III
Ernest Lloyd Dunn
Heather Jane Low
Leighton Brown Parker, Jr.
Linda Orr
Benita Burton Jankle
Elizabeth Anne Barnett
John Austin Ryan, Jr.

Magna cum laude

JUNE 7, 1965

Guy Anthony Bayes
Barbara Ruth Sears
Alice Holland Estes
Margaret Lyle Smith
Irene Vertna Gulledge Lopp
Karen Wiman Luce
Robert David Carlitz
Charles Denny White, Jr.
Susan Elizabeth Appleton
Mary Ann Plant
Nancy Lee Moore
Samuel Maxwell Myers, Jr.
Ronald James Vaughan
John Lawrence Sullivan
Thomas James Herin
Judith Ann Baker
Barbara Ann Blohm
Judith Ann Rector
Rebecca Joan Frank
Martha Frances Hamilton
Patricia Gray Smith
Carol Louise Gegauff
Sarah Lynn Weaver
Mary Frances Williams
Clint Clarinda Jennison
James Russell Sites
John Albert Elias
Jane Wallace Titus
Ruth Marion Sutch
Mary Melinda Miller
Mary Carol Tarpley
Wenonah Celeste Heyl
Susan Jane Pauly
Pamela Leroy Pugh
Kathryn Ann Vale

HONORS IN DEPARTMENTS AND SCHOOLS

DEPARTMENTAL GRADUATION WITH DISTINCTION

Art

Clint Clarinda Jennison

Botany

Marshall Robert Crosby
Lloyd Ernest Dunn

Chemistry

Henry David Connor
Irene Vertna Gulledge Lopp
Ronald James Vaughan
Charles Stephen Foster

Civil Engineering

Ralph Edward Brown
Joseph Stephen Simon
William Anderson Simpson

Economics

Margaret Katherine Pauley

Electrical Engineering

Colonel Blake McDowell, III
Wayne Terryl Peterson
William Thomas Warren

English

Maurine Doggett
Stephen Douglas Fox
Margaret Ann Gilliland
Wenonah Celeste Heyl
Benita Burton Jankle
Catherine Jane Reeve Love
Karen Wiman Luce
Marjorie Ann O'Neall
Carol Baldwin Papps
Mary Ann Plant
Sidney W. Reid, Jr.
Stanley Sidney Ward
Sarah Lynn Weaver

History

Ernest Jackson Branscomb, Jr.
Chesley Carlisle Herbert, III
Michael Scott Patterson
John Austin Ryan, Jr.
Ronald Vance Shearin

Mechanical Engineering

Robert Ramsey Reed
David William Minnotte
Robert Bruce Graham

Music

Barbara Grace Watson

Political Science

Patricia Lee Adams
Lynn Etheridge
Edith Ann Fraser
Heather Jane Low
Overman Randolph Rollins

Psychology

Harry Williams Harper

Religion

Martha Dillard Franck
Evelyn Jeannine Krueger

Romance Languages

Charles Garon Stephens

Sociology

Barbara Ellen Cook

Zoology

Margaret Alice Osborne

COLLEGE OF ENGINEERING

JUNE 7, 1965

Magna cum laude

Paul Frederick Brown, Jr.
Wayne Terryl Peterson
William Thomas Warren

Elections to Tau Beta Pi

Edward Forrest Baird
Paul Frederick Brown, Jr.
Ralph Edward Brown
George Horace Flowers, III
Robert Bruce Graham
C. Blake McDowell, III
Walter Cade Metz, Jr.
David William Minnotte
James McNeil Archer Parsley
Wayne Terryl Peterson
Robert Ramsey Reed
Joseph Stephen Simon
William Anderson Simpson
John Franklin Walden
William Thomas Warren

DIVINITY SCHOOL

Summa cum laude

Jerry O'Neil Cook
Philip Allen Pharr

Magna cum laude

Samuel Wyndham Anderson
Hubert Trevelyan Davis
Donald Peyton Fortenberry
Hubert Sydney Huggins
Robert Taylor Scott
John Lawrence Sharpe, III
Clark A. Thompson

SCHOOL OF LAW

Elections to the Order of the Coif

Peter Burns Archie
Charles Lloyd Bateman
Thomas Andrew Edmonds
John Miller Hines
Thomas Patrick Meehan
Jay Edward Moyer
Gary Thornton Nelms
Robert Clyde Sink
Ward Barker Stevenson, Jr.

Graduated with Distinction

Peter Burns Archie
Charles Lloyd Bateman
Joseph James Brigati
William Midwood Curtis
Thomas Andrew Edmonds
John Miller Hines
William Henry Lear
Thomas Patrick Meehan
Jay Edward Moyer
Gary Thornton Nelms
William Jackson Norton
Robert Clyde Sink
Spencer Berne Smith
Ward Barker Stevenson, Jr.
Robert Edward Young

SCHOOL OF MEDICINE

Elections to Alpha Omega Alpha

Darell Doty Bigner
Gene Allen Butcher
John Logan Emlet
Herman Kalman Gold
John Miles Harrelson, III
Ronald Paul Krueger
Stephen Maier Kulvin
Bruce Allan Lucas
Frank Hamilton McGregor, Jr.
Andrew Richard Price
Larry Arch Rogers
William Hall Spencer, III
Karl David Straub
Creighton Bolter Wright
Sara Kay Shilling Zirkle

SPECIAL PRIZES AND AWARDS

American Public Works Association Prize—Joseph Stephen Simon
American Society of Civil Engineers Prize—Ralph Edward Brown
William Anderson Simpson
American Society of Mechanical Engineers Prize—Robert Ramsey Reed
Borden Undergraduate Research Award in Medicine—Larry Arch Rogers
Davison Scholarship (1964) Award—Jack Borden Taylor
Duke University School of Nursing Award—Alice Corbly Kern
Frank L. Engel Scholarship in Endocrinology Award—Richard Irving Katz
Erasmus Club Prize in the Humanities—First Prize, 1964—Kathryn Ann Vale
First Prize, 1965—Stephen Douglas Fox
Second Prize, 1965—Linda Orr
Hamilton Watch Award—George Horace Flowers, III
Industrial Press Award—Thomas Cornell Berry
Thomas Jefferson Awards—Arthur Gaspar Cavallaro
Kenneth Paul Ramming
Lange Medical Publications Awards—Sara Kay Shilling Zirkle
William Hall Spencer, III
William T. Laprade History Prize—Chesley Carlisle Herbert, III
Michael Scott Patterson
Robert E. Lee Prize—Dennis H. Ferguson
Machinery Magazine's Award—Robert Lendon Brantley
Merck Index Awards—Leighton Brown Parker, Jr.
Ronald James Vaughan
Merck Manual Awards—Lewis Matthew Flint, Jr.
Joseph Eldridge Markee, Jr.
Milmow Prize—Joseph Neely McIntire
C. V. Mosby Book Awards—Darell Doty Bigner
John Logan Emlet
John Miles Harrelson, III
Ronald Paul Krueger
Andrew Richard Price
Moseley Award—Jo Ann Appleyard
North Carolina Association of C.P.A. Medal—John Weiss Harris
Roche Award—William Hall Spencer, III
Walter J. Seeley Scholastic Excellence Award—Paul Frederick Brown, Jr.
George Sherrerd III Memorial Award in Electrical Engineering—
Paul Frederick Brown, Jr.
Smith, Kline and French Award for Medical Writing—Larry Arch Rogers

ELECTIONS TO PHI BETA KAPPA DURING 1964-65

Susan Elizabeth Appleton
Lucile Jamison Anutta
Edward Forrest Baird
Judith Ann Baker
Elizabeth Anne Barnett
Kenneth Carrington Bass, III
Edna Grace Bay
Guy Anthony Bayes
Barbara Ann Blohm
Mary Brantley Boyd
Ernest Jackson Branscomb, Jr.
Nancy Sunderland Brown
Paul Frederick Brown, Jr.
Ralph Edward Brown
Robert David Carlitz
Barbara Ellen Cook
Dwight Phelps Cruikshank, IV
Anne Elizabeth Davis
Grayce Bieg Dawson
John Charles Doelle
Maurine Doggett
Leonora Ann Dreisinger
Ernest Lloyd Dunn
John Albert Elias
Alice Holland Estes
Lynn Etheridge
Thomas Steven Evans
Judith Ewell
George Horace Flowers, III
Charles Stephen Foster
Stephen Douglas Fox
Martha Dillard Franck
Rebecca Joan Frank
Susan Widstrom Gamelin
Carol Louise Gegauff
Sara Jean Gillespie
Margaret Ann Gilliland
Robert Bruce Graham
Caroline Lewis Gram
Robert Thomas Graybeal
Michael Steven Greenly
Martha Frances Hamilton
John Weiss Harris
Joyce Harrold
Mary Caroline Heald
Hugh Littell Henry

Thomas James Herin
Wenonah Celeste Heyl
Rebecca Thompson Hill
David Caster Hoaglin
Thomas Morgan Hyers
Benita Burton Jankle
Clint Clarinda Jennison
Patricia Mary Kasmar
Sherry Ann Kellett
Noel James Kinnamon
Richard Dietrich Krebs
Evelyn Jeannine Krueger
Irene Vertna Gulledge Lopp
Catherine Jane Reeve Love
Heather Jane Low
Karen Wiman Luce
Ralph Emerson Mann, II
Mary Bynum Martin
Walter Cade Metz, Jr.
Alan Howard Meyer
Mary Melinda Miller
David William Minnotte
Nancy Lee Moore
William G. Moorefield, Jr.
Samuel Maxwell Myers, Jr.
Mary Burckel Nada
Marjorie Ann O'Neall
Linda Orr
Margaret Alice Osborne
Leighton Brown Parker, Jr.
Linda Warren Parks
Margaret Katherine Pauley
Ann Florence Pauly
Susan Jane Pauly
Wayne Terryl Peterson
Mary Ann Plant
Ann Tonnelier Pilgram
Pamela LeRoy Pugh
William Elgin Pursley, Jr.
Judith Ann Rector
Robert Ramsey Reed
James Andrew Reiffel
Terence Nat Reisman
Mary Dyer Robb
Jane Turney Robbins
Overman Randolph Rollins
John Austin Ryan, Jr.
William Earl Sasser
Barbara Ruth Sears
Joseph Stephen Simon
Robert Lyndon Simpson, Jr.
William Anderson Simpson
James Russell Sites
Margaret Lyle Smith
Patricia Gray Smith
Ann Lyn Stephens
Pamela Sun Stewart
John Lawrence Sullivan
Ruth Marian Sutch
Mary Carol Tarpley
Jane Wallace Titus
Kathryn Ann Vale
Carol Emily Van de Ree
Ronald James Vaughan
Stanley Sidney Ward
William Thomas Warren
Patricia Waterman
Barbara Grace Watson
Wendy Patricia Watson
Sarah Lynn Weaver
Charles Denny White, Jr.
Mary Frances Williams
Judy Jo Worley
Carl Frederick Yaeger, II

Elections from among Ph.D. Candidates, 1964-65

Sandra Boatman
Gary Leroy Maris
James Joseph McLeskey, III
Robert Paul Schultz
Robert Edward Webster
David Eugene Whisnant

TRINITY COLLEGE

FRESHMAN HONORS

Students listed according to average

Robert Emerson Lasky
John Seaman Townsend
Bruce Douglas Noe
John Oliver Evans, Jr.
Jasper Lee Cummings, Jr.
John Jefferson Davis
Gary Richard Feichtinger
John Kelver Willis
William Roy Taylor, Jr.
Ronald Jay Stanley
James William Kalat
Michael Robin Flick
Darland Conrad Smith
William Noel Greene
Ronald Lee Polderman
Eric Charles Bergman
William B. Lawrence
David Lawrence Kneapler
John Fred Eggleston, Jr.
Richard William Reifsnyder
Edward Joseph Sullivan
Thomas Adams Harris
Mark Heaney
Philip Martin Parmesano
Joseph Bancroft Lesesne
Paul Regan Winters
Richard Thomas Batts
John Charles Boger
Joel Barr
Charles Cowling Couper

SOPHOMORE HONORS

Kenneth Clyde Fischer
Richard Rutter Gross
Richard William Tasker
Donald Arthur Phillips
Sherman Lee Stratton
Donald Craig Brater
James Hubert Coil, III
Donald Allen Peck
Charles G. Patterson, III
Douglas Michael Shasby
David Jackson McGinty
William Orr Wagner
John Ralph Weisner
Eric Alfred Baylin
William Lank High
Monty Woodall Cox
Dean Thomas Hokanson
John Frederic Modlin
Philip Gendron Palmer
Julian Robert Raper, III
Jeffrey Smith Werner

JUNIOR HONORS

Leslie Pearlstein
Richard F. Pfizenmayer
Robert C. Wheland
Edward C. Schweitzer, Jr.
Robert Lester Latta
Frank J. Huffman, Jr.
Robert W. Widell
Julian D. Heller
Richard Dell Ziegler
Samuel M. Bradley
Scot G. Hickman
Rodney Hammond Lusk
Michael Claude Russ
Timothy E. Anna
Dexter L. Jeffords
John D. Sutherland
Todd M. Lieber
Jon W. Stuebner
Robert Harvey Swennes, II
Bruce J. Alexander
Charles F. Altman
Frederick Purnell, Jr.
William B. Settlemyer

THE COLLEGE OF ENGINEERING

SOPHOMORE HONORS

Students listed according to average

Larry Walter Thomas
Robert Nall Bright
Charles Gerrall Browne

JUNIOR HONORS

Nicholas Brienza
Kenneth E. Wilkes
Linwood A. McCullers
Charles H. Rogers
Glenn N. Rupp
James B. Urquhart, III
Lester Hill
Craig S. Volland
Jeffrey M. Brick
Harry P. Gray
Martin D. Silver
Robert N. Armstrong

THE WOMAN'S COLLEGE

FRESHMAN HONORS

Students listed according to average

Dorothy Mary Gohdes
Katherine K. Humphreys
Jacqueline Mary French
Patricia Gray Berg
Gwynne Lula Ormsby
Martha Carol Brimm
Ann Leslie Stanford
Sandra Cathleen Paine
Linda Joyce McKissack
Betsy Bell Link
Constance Chase Macleod
Kay Kristin Arthur
Carol Chapman
Patricia Ann Hurdle
Catherine Ruth Babcock
Anne Aylesbury McCoy
Susan Patricia Posey
Svea Sarah Oster
Nancy Marlyn Reichley

SOPHOMORE HONORS

Karen Diane Volz
Karlen Ruth Lyons
Nancy Elinor Allison
Janet Elizabeth Gurkin
Carolyn Leslie Withers
Mary Eleanor Baluss
Anne Walker White
Elaine Ehrensperger
Mary Kathryn Gnuse
Barbara Sherry Nadel
Ann Katharine Ball
Natalie Christine Moore
Josephine T. Humphreys
Susan V. Richardson
Carol Ann Barthel
Elizabeth Anne Knox
Susan Jeannette Henney
Emily Hughes Wyatt
Vivian Collier
Holly Wilson Davis
Kathryn Talcott Munson
Janet E. Poppendieck
Sharon Paine Stephens
Geraldine Ruth Cleary
Katherine G. Murray
Judith Ann Nicholson
Dorothy Loreue Feeney
Sally Johanna Overaker

JUNIOR HONORS

Martha C. Hervey
Georgiandra Little
Judith A. Rudolph
Charleene Lance Jordan
Sarah M. Mulder
Barbara G. Buckman
Diann Marie Miller
Carolyn L. Ray
Frances A. Kiner
Ingrid D. Arnold
Teresa A. Patch
Cynthia A. Gilliatt
Ann Wilkie MacLean
Peggy Jolene Spivey
Charlotte A. Bunch
Joan F. Carew

Dorothy H. Daniel
Susan V. Reynolds
Eleanor A. Sampson
Mary E. Snyder
Carolyn L. Sherman
Nancy W. Stead
Sarah Howe Kirby-Smith
Martha L. Dantzler
Jill H. Salinger
Leslie L. Davidson
Rilla L. Carter
Louise B. Kennedy
Carolyn A. Cox
Mary E. Pickering
Linda B. Gregory
Julia M. Wanless
Jane R. Levine
Elizabeth E. McComb
Sherry A. Kellett
Lucia E. Simpson
Sarah L. Baker
Susan W. Bayles
Elease C. Latimer
Susan E. Doerner

Summary

ENROLLMENT ON THE SEMESTER BASIS 1964-1965

School or College	*Fall Semester 1964*	*Spring Semester 1965*
TRINITY COLLEGE		
Regular Students	2,059	1,997
Special Students	47	60
Total	2,106	2,057
COLLEGE OF ENGINEERING		
Regular Students	405	370
Special Students	3	3
Total	408	373
WOMAN'S COLLEGE		
Regular Students	1,229	1,171
Special Students	37	36
Total	1,266	1,207
SCHOOL OF NURSING		
Regular Students	266	247
Special Students	16	19
Total	282	266
DIVINITY SCHOOL		
Regular Students	244	232
Special Students	11	12
Total	255	244
SCHOOL OF FORESTRY		
Regular Students	53	58
Special Students	19	15
Total	72	73
SCHOOL OF LAW		
Regular Students	303	300
Special Students	—	—
Total	303	300

GRADUATE SCHOOL OF ARTS AND SCIENCES		
Regular Students	737	701
Special Students	569	541
Total	1,306	1,242
TOTAL ENROLLED ON SEMESTER BASIS		
Regular Students	5,296	5,076
Special Students	702	686
Total	5,998	5,762

ENROLLMENT ON THE QUARTER BASIS 1964-1965

	Summer Session 1964	First Quarter 1964	Second Quarter 1964	Third Quarter 1965	Fourth Quarter 1965
MEDICAL SCHOOL					
Regular Students	99	325	319	307	288
Fellows	64	64	64	64	64
Interns	66	66	66	66	66
Residents	234	234	234	234	234
TOTAL ENROLLED ON QUARTER BASIS	463	689	683	671	652

MISCELLANEOUS TERMS

COURSE	Number of Students	Length of Term	Beginning of Term
Anesthesiology	8	18 mos.	Registration January
Dietetics	10	12 mos.	Registration September
Hospital Administration	23	24 mos.	Registration Jan. & July
Master of Science in Nursing	7	12 mos.	Registration September
Pharmacy Interns	2	12 mos.	Registration June
Physical Therapy	15	15 mos. & 24 mos.	Registration September
Radioisotope Technician	5	3 mos.	Registration Varies
X-Ray Technology	9	24 mos.	Registration September

SUMMARY: FALL AND SPRING ENROLLMENT 1964-1965

Fall Enrollment	6,687
Spring Enrollment	6,433

SUMMER ENROLLMENT

	Term I	Term II	July
Regular Students	1,636	1,347	
Mycology			18

Government, Administration, and Instruction

THE UNIVERSITY TRUSTEES		36
TRUSTEES EMERITI		11
EMERITI		54
GENERAL ADMINISTRATION		13
INSTRUCTIONAL STAFF		964*
Professors	276	
Associate Professors	210	
Associate Professors	221	
Associates	57	
Adjunct Faculty	30	
Lecturers	8	
Instructors	44	
Part-time Instructors and Graduate Tutors	103	
Visiting Professors and Lecturers	28	
EDUCATIONAL ADMINISTRATION		24†
BUSINESS ADMINISTRATION		20‡
INSTITUTIONAL ADVANCEMENT		34§
STUDENT LIFE		20**
OTHER OFFICERS		67††
Duke University Press	5	
Music and Art	4	
Physical Education, Trinity College	20	
House Counselors, Woman's College	13	
Food Services	17	
The University Stores	9	
THE UNIVERSITY LIBRARIES		98‡‡
TOTAL		1332§§

* Includes nine officers listed with the General Administration.

† Does not include eight officers listed with the General Administration and twenty-three officers with academic rank listed with the Instructional Staff.

‡ Does not include one officer listed with the General Administration.

§ Does not include two officers listed with the General Administration.

** Does not include one officer listed with the General Administration, five officers with academic rank listed with the Instructional Staff and two officers listed with the Educational Administration.

†† Does not include one officer listed with General Administration and thirteen officers with academic rank listed with the Instructional Staff.

‡‡ Does not include two officers with academic rank listed with the Instructional Staff.

§§ Does not include duplications. An officer is counted in the first category in which his name appears.

Index

Academic-Professional Combiuations, 127
Accounting Courses, 145
Accounting, Specialized Program in, 118
Administration, Officers of
  Business Administration, 65
  Educational Administration, 63
  General Administration, 22
  Institutional Advancement, 66
  Summary, 665
Admission
  Divinity School, 233
  Forestry School, 286
  Graduate School, 318
  Law School, 425
  Medical School, 462
  Nursing School, 552
  Summer Session, 591
  Undergraduate Colleges, 80
Advanced Placement, 111
Advanced Placement Course Credit, 111
Advanced Standing, Admission to, 80
Aerospace Studies, 130
Aesthetics Courses, 131
Alumni
  Associations, 642
  National Council, 642
  Office, 642
  Organizations, 642
  Publications, 642
American Christianity Courses, 257
American Literature Courses, 153, 381
American Schools of Oriental Research, 229
Anatomy Courses, 361
Anesthesia, 538
Anthropology Courses, 205
Application for Admission
  Divinity School, 233
  Forestry School, 286
  Graduate School, 318
  Law School, 425
  Medical School, 462
  Nursing School, 552
  Summer Session, 591
  Undergraduate Colleges, 80
Appointments Office, 83
Army Nurse Corps, 562
Art and Illustration, Medical, 536
Art and Music Officers, 69-70
Art Courses, 131
Assistantships, 340
Athletics
  Intercollegiate, 85
  Participation in, 115
Attendance Regulations, 109
Audit, 105
Automobile Regulations, 114
Awards
  Conferred, June, 656
  Informatiou on, 99, 101, 110

Bachelor of Arts
  Awarded, June, 645
  Awarded, September, 654
  Requirements, 116
Bachelor of Divinity
  Awarded, June, 651
  Requirements, 238
Bachelor of Laws
  Awarded, June, 651
  Requirements, 432
Bachelor of Science
  Awarded, June, 648
  Awarded, September, 654
  Requirements, 122
Bachelor of Science in Engineering
  Awarded, Juue, 649
  Awarded, September, 655
  Requirements, 123
Bachelor of Science in Nursiug
  Awarded, June, 649
  Requirements, 571
Bacteriology Courses, 396
Bar Examinations, 427
Bequests and Gifts, 643
Biblical Studies Courses, 253
Biochemistry Courses, 363
Botany Courses, 364
Business Administration Courses, 145
Business, Specialized Program in, 117
Bylaws of the Uuiversity, 11

Calendar of the Colleges, 7
Cancer Training Program, 531
Charter of the University, 10
Chemistry Courses, 137, 366
Christian Education, 261
Church History Courses, 255
Civil Engineering
  Courses, 212
  Degree in, 123
Class Limits
  Summer Session, 622
Class Standing, 106
College of Engineering
  Courses, 212
  Degrees, 123
Commissions
  AFROTC and NROTC, 88
  Awarded, June, 654
Comparative Literature, 141, 368
Conduct, 114
Corporation, University
  Executive Committee, 19
  University Committee, 19
  University Trustees, 18
Costs
  Divinity School, 265
  Forestry School, 297
  Graduate School, 343
  Law School, 428
  Medical School, 456, 465
  Nursing School, 556
  Summer Session, 593
  Undergraduate Colleges, 93
Courses of Instruetion
  Accounting, 145
  Aerospace Studies, 130
  Aesthetics, 131
  American Christianity, 257
  American Literature, 153, 381
  Anatomy, 361,
  Anthropology, 205, 417
  Art, 131, 362
  Bacteriology, 396
  Biblical Studies, 253
  Biochemistry, 363
  Botany, 364
  Business Administration, 145
  Chemistry, 137, 366
  Christian Education, 261
  Chrisitan Theology, 258
  Church History, 255
  Civil Engineering, 212, 376
  Classical Studies, 139, 368
  Colloquium, 171
  Comparative Literature, 141, 368

Design, 131
Drama, 153
Economics, 142, 369
Education, 148, 371
Electrical Engineering, 214, 378
Elementary Education, 148
Engineering, 212, 376
English, 152, 381
English Literature, 152
Forest Botany, 158
Forestry, 158, 305, 384
French, 199, 414
Geology, 158, 387
Germanic Languages, 159, 388
Greek, 139
Health, 161
Health Education, 161
Hindi-Urdu, 164
Historical Theology, 256
History, 165, 389
History of Religion, 257
Honors-Masters Program, 171
Hospital Administration, 393
Immunology, 396
International Law, 191, 405
Italian, 199
Latin, 139, 415
Law, 445
Linguistics, 171
Mathematics, 172, 394
Mechanical Engineering, 218, 380
Medical Science, 175
Microbiology, 396, 487
Music, 175
Mycology, 135
Naval Science, 180
New Testament, 254
Nurse Anesthesia, 538
Nursing, 571
Old Testament, 253
Pastoral Care, 262
Philosophy, 182, 398
Physical Education, 161
Physical Therapy, 422, 538
Physics, 184, 400
Physiology, 402
Political Science, 186, 404
Portuguese, 199
Preaching, 263
Psychology, 191, 407
Religion, 195, 410
Romance Languages, 199, 414
Russian, 204, 417
Secondary Education, 148
Sociology, 205, 417
Spanish, 199, 416
Speech, 153
Theology, 258
World Christianity, 257
Worship and Church Music, 263
Zoology, 208, 420

Degrees Conferred, June
Bachelor of Arts, 645
Bachelor of Divinity, 651
Bachelor of Laws, 651
Bachelor of Science, 648
Bachelor of Science in Engineering, 649
Bachelor of Science in Nursing, 649
Doctor of Education, 653
Doctor of Forestry, 653
Doctor of Medicine, 652
Doctor of Philosophy, 653
Master of Arts, 651
Master of Arts in Teaching, 650
Master of Education, 650
Master of Forestry, 650
Master of Hospital Administration, 650
Master of Religious Education, 650
Master of Science, 650
Master of Science in Nursing, 650
Master of Theology, 653
Degrees Conferred, September,
Bachelor of Arts, 654
Bachelor of Science, 654
Bachelor of Science in Engineering, 655
Doctor of Education, 656
Doctor of Medicine, 656
Doctor of Philosophy, 656
Master of Arts, 655
Master of Arts in Teaching, 655
Master of Education, 655
Master of Science, 655
Degrees, Requirements for
Bachelor of Arts, 116
Bachelor of Divinity, 238
Bachelor of Laws, 432
Bachelor of Science, 122
Bachelor of Science in Engineering, 123
Bachelor of Science in Medicine, 471
Bachelor of Science in Nursing, 571
Doctor of Education, 338
Doctor of Forestry, 291
Doctor of Juridical Science, 436
Doctor of Medicine, 471
Doctor of Philosophy, 334
Master of Arts, 328
Master of Arts in Teaching, 332
Master of Comparative Law, 435
Master of Education, 331
Master of Forestry, 288
Master of Hospital Administration, 334
Master of Laws, 434
Master of Religious Education, 249
Master of Science, 331
Master of Science in Nursing, 584
Master of Theology, 251
Dental School, Preparation for, 121
Development, See Institutional Advancement
Dining Service, 95
Discipline, 114
Distinction, Graduation, 111
Divinity School
Admission, 233
American Schools of Oriental Research, 229
Bachelor of Divinity, 238
Courses, 253
Courses of Study, 253
Fees, 265
Fellowships, 276
Library, 76
Living Accommodations, 265
Master of Religious Education, 249
Master of Theology, 251
Registration, 233
Students Government Association, 231
Doctor of Education
Awarded, June, 653
Awarded, September, 656
Requirements, 338
Doctor of Forestry
Awarded, June, 653
Requirements, 291
Doctor of Juridical Science
Requirements, 436
Doctor of Medicine
Awarded, June, 652
Awarded, Sept., 656
Requirements, 471
Doctor of Philosophy
Awarded, June, 653
Awarded, September, 656
Requirements, 334
Dormitories, 95
Drama Courses, 153
Duke University Press, Officers, 69

Economics Courses, 142, 369
Education Courses, 148, 371

Educational Administration, 63
Electrical Engineering
  Courses, 214
  Degree in, 123
Elementary Education Courses, 148
Emeriti, 20
Engineering, see College of,
English Courses, 152, 381
English Literature Courses, 152
Enrollment Statistics, 665
Examinations
  Doctoral, 339, 336
  Master's, 328
  Undergraduate, 108-109
Executive Committee, University, 19
Expenses and Fees
  Divinity School, 265
  Forestry School, 297
  Graduate School, 343
  Law School, 428
  Medical School, 456, 465
  Nursing School, 556
  Summer Session, 593
  Undergraduate Colleges, 93

Fellowships, 340
Food Services, Officers, 71
Forest Botany Courses, 158
Forest, Duke, 284
Forestry School
  Admission, 286
  Combination Course, 127
  Courses, 158, 305, 384
  Doctor of Forestry Degree, 291
  Duke Forest, 284
  Fees, 297
  Fellowships, 302
  Forestry in the Graduate School, 296
  Living Accommodations, 297
  Master of Forestry Degree, 288
  Scholarships, 302
Fraternities, 86
French Courses, 199, 414
Freshman Class, Admission to, 80

Geology Courses, 158, 387
Germanic Languages, 159, 388
Gifts and Bequests, 643
Government of the University
  Bylaws, 11
  Charter, 10
  Indenture of Trust, 9
  Officers, 14
  Retirement, 17
  Sabbatical Leave, 17
Grade Regulations
  Divinity School, 247
  Forestry School, 287
  Graduate School, 321
  Law School, 433
  Nursing School, 566
  Summer Session, 603
  Undergraduate Colleges, 108
Graduate Record Examination, 318
Graduate School of Arts and Sciences
  Admission, 318
  Assistantships, 340
  Candidacy for Advanced Degrees, 318
  Courses, 361
  Doctor of Education Degree, 338
  Doctor of Philosophy Degree, 334
  Engineering, 376
  Fees, 343
  Fellowships, 340
  Foreign Students, 319
  General Regulations, 318
  Master of Arts Degree, 328
  Master of Arts in Teaching Degree, 332
  Master of Education Degree, 331
  Master of Hospital Administration, 334
  Master of Science, 331
  Masters' Degrees, Regulations, 328
  Registration, 321, 323
  Research Facilities, 348
  Scholarships, 340
  Summer Session, 360
Greek Courses, 139
Guidance, Bureau of Testing and, see University Counceling Center

Health Courses, 161
Health Education Courses, 161
High School Teaching,
Hindi-Urdu, 164
Historical Theology Courses, 256
History Courses, 165, 389
History of Religion, 257
History of the University, 8
Honors
  Class, 110
  Graduation, 656
  Conferred, June, 656
  Information on, 99, 101, 110
Honors-Masters Program, 171
Hospital
  Facilities, 454
  Nurse Anesthesia, 538
Hospital Administration, School of, 393
House Counselors, 71

Indenture of Trust, 9
Independent Study, 112
Institutional Advancement, 66
Instruction, Officers of
  Institutional Advancement, 66
  Instructional Staff, 23
  Part-time Instructors, 58
  Summary, 665
Intercollegiate Athletic Program, 85
International Law Courses, 191, 405

Language Requirements
  Bachelor of Arts, 116
  Bachelor of Divinity, 238
  Bachelor of Science, 122
  Doctor of Forestry, 291
  Doctor of Philosophy, 334
  Masters of Arts, 328
Latin Courses, 139, 415
Law School
  Admission, 425
  Bachelor of Laws Degree, 432
  Bar Examinations, 427
  Business Courses, 445
  Candidacy for Advanced Degrees, 434
  Combination Courses, 128
  Courses, 445
  Doctor of Juridical Science Degree, 436
  Fees, 428
  Fellowships, 428
  Grades, 433
  Library, 438
  Loans, 428
  Master of Comparative Law, 435
  Master of Laws Degree, 434
  Program of Instruction, 432
  Registration, 427
  Scholarships, 428
Law School Library Staff, 76
Libraries, Staffs,
  Divinity, 76
  Engineering, 76
  Forestry, 76
  Law, 76
  Medical, 76
  University, 73
  Woman's College, 75
Linguistics, 171
Living Accommodations
  Divinity School, 265

Forestry School, 297
Nursing School, 558
Undergraduate Colleges, 95
Loan Funds, 99, 276, 302, 428, 559

Master of Arts
Awarded, June, 651
Awarded, September, 655
Requirements, 328
Master of Arts in Teaching
Awarded, June, 650
Awarded, September, 655
Requirements, 332
Master of Comparative Law
Requirements, 435
Master of Education
Awarded, June, 650
Awarded, September, 655
Requirements, 331
Master of Forestry
Awarded, June, 650
Requirements, 288
Master of Hospital Administration
Awarded June, 650
Requirements, 334
Master of Laws
Requirements, 434
Master of Religious Education
Awarded, June, 650
Requirements, 249
Master of Science
Awarded, June, 650
Awarded, September, 655
Requirements, 331
Master of Science in Nursing
Awarded, June, 650
Requirements, 584
Master of Theology
Awarded, June, 653
Requirements, 251
Mathematics Courses, 172, 394
Mechanical Engineering
Courses, 218
Degree in, 123
Medals, 101
Medical Art and Illustration Division, 536
Medical Care, 82, 266, 300, 345, 431, 458, 563, 597
Medical School
Admission, 462
Anatomy, 473
Biochemistry, 477
Cancer Training Program, 531
Dietetics, 535
Doctor of Medicine, 471
Endocrinology, 479
Fees, 465
Hospital Administration, School of, 535
Library, 456
Medical Art and Illustration Division, 536
Medical Technology, 537
Microbiology & Immunology, 487, 396
Obstetrics & Gynecology, 490
Pathology, 494
Pediatrics, 499
Physical Therapy, 422, 538
Physiocology & Pharamacology, 503
Postgraduate Study, 533
Preventive Medicine, 506
Psychiatry, 508
Radioisotope, 539
Radiology, 517
Student Government, 460
Surgery, 518
Undergraduate Cancer Training Program, 531
Veterinary Medicine, 532
X-Ray Technology, 540
Medical School Library Staff, 76
Microbiology Courses, 487, 396
Music and Art Officers, 69
Music Courses, 175
Musical Organizations, 87
Mycology Courses, 135, 610

National Council of Duke University, 642
Naval Reserve Corps, 88
Naval Science Courses, 180
Navy Nurse Corps, 562
New Testament Courses, 254
Nursing School
Admission, 552
Army Nurse Corps, 562
Bachelor of Science in Nursing, 571
Courses, 573
Fees, 556
Graduate Study, 578
Living Accommodations, 558
Loans, 559
Master of Science in Nursing, 578
Medical Care, 563
Medical Program, 587
Navy Nurse Corps, 562
Special Students, 555
Scholarships, 559
Summer Session, 566
Nutrition Courses, 535

Officers, Emeriti, 19, 20
Officers of Administration
Business Administration, 65
Educational Administration, 63
General Administration, 22
Institutional Advancement, 66
Student Life, 68
Summary, 665
Officers of Instruction
Instructional staff, 23
Part-time Instructors, 58
Summary, 665
Old Testament Courses, 253
Organizations, Undergraduate Student, 85, 86, 88

Pastoral Care Courses, 262
Pathology Courses, 494
Pediatrics Courses, 499
Pharmacology Courses, 503
Phi Beta Kappa, 658
Philosophy Courses, 182, 398
Physical Education
Courses, 161
Requirements, 84
Physical Therapy Courses, 422, 538
Physics Courses, 184, 400
Physiology Courses, 402
Political Science Courses, 186, 404
Preaching Courses, 263
Prizes
Awarded, June, 658
Information, 101
Psychiatry Courses, 508
Psychology Courses, 191, 407
Publication of Dissertation, 337
Publications
Alumni, 642
Student, 86
Public Law Courses, 447

Quality Credit, 105
Quantity Credit, 105

Radiology Courses, 517
Registration
Divinity School, 233
Graduate School, 321, 323
Law School, 427
Medical School, 462
Nursing School, 552
Summer Session, 600

Undergraduate Colleges, 107
Religion Courses, 195, 410
Religious Life Program, 87
Requirements
Continuation of College, 105, 107
Graduation from College, 105, 107
Research, 340
Reserve Officers Training Corps
Air Force, 91
Naval, 89
Nurse, 562
Residence Requirements
Forestry School, 288, 291
Graduate School, 318
School of Nursing, 566
Undergraduate Colleges, 107
Retirement, 17
Romance Languages Courses, 199, 414
ROTC's
Air Force, 90
Naval, 88
Russian Courses, 204, 417

Sabbatical Leave, 17
Scholarships
Divinity School, 276
Forestry School, 302
Graduate School, 340
Law School, 428
School of Nursing, 559
Undergraduate Colleges, 97
Science Education Major, 120
Secondary Education Courses, 148
Service, Student Life and, 82
Size of Classes
Summer Session, 622
Social and Cultural Organizations, 82
Social Functions, 85
Sociology Courses, 205, 417
Sororities, 86
Special Students, 96
Spanish Courses, 199, 416
Speech Courses, 153
Student Aid, 97
Student Employment, 97
Student Government Associations
Divinity School, 231
Law School, 426
Medical School, 460
School of Nursing, 550
Undergraduate Colleges, 86
Student Life, 82
Study Abroad, 113
Summary of Officers, 665
Summer Session
Admission, 591
Courses, 622
Credit, 603
Divinity School Courses, 621
Doctor of Education Degree, 614
Doctor of Philosophy Degree, 614
Fees, 593, 596
Graduate School, 612
Master of Arts Degree, 614
Master of Arts in Teaching Degree, 617
Master of Education Degree, 616
Master of Science Degree, 618
Mathematics & Science Institute, 608
Registration, 600

Theology Courses, 258
Thesis
Doctor of Education, 338
Doctor of Forestry, 291
Doctor of Philosophy, 334
Master of Arts, 328
Master of Arts in Teaching, 332
Master of Education, 331
Master of Forestry, 288
Master of Hospital Administration, 334
Master of Science, 334
Transcripts, 115, 325
Transfer Credits
Graduate School, 322
Summer Session, 605
Undergraduate Colleges, 109
Trustees, 18

Undergraduate Colleges, General Statement, 80
Units of Admission, 80
University Counseling Center, 83, 606
University, General Statement, 8
Universty Press Staff, 69
University Stores, Officers, 72

Woman's College Library Staff, 75
World Christianity, 258
World Rule of Law Center, 438
Worship in Church Music, 263

X-Ray Technology Courses, 540

Zoology Courses, 208, 420

Bulletin of Duke University

Information for Prospective Students



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Information for Prospective Students

June 1965

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Contents

Calendar of the Colleges ..... inside back cover
The University 4
Location 5
The Faculty 6
The Student Body 6
Libraries and Laboratories 7
Admission 9
Early Decision Plan 10
Regular Admission 10
Admission to Advanced Standing 10
Advanced Placement and Credit 11
College Expenses 13
Financial Aid 14
Residence Houses 16
Special Living Groups 16
The Curriculum 21
Planning for the Future 22
Graduate Study 22
Honors-Masters 22
Law 23
Medicine and Dentistry 23
Theology and Religious Education 23
Academic-Professional Programs 23
Teaching 24
Accounting 24
Business 24
Engineering 24
The ROTC 26
Student Life 28
Religious Life 29
Music, Speech, and Dramatics 30
Publications 32
The Student Union 33
Physical Education 33
Intercollegiate Athletics 34
Student Health 35
General Information 41
Courses 42

The University

Although Duke University as a corporate entity dates from 1924, its roots go back nearly a century and a quarter to the Union Institute, founded in 1838 in Randolph County. "Dedicated to the erasing of ignorance and error and to the education of responsible citizens," the Institute grew slowly for a decade. In 1859 it was formally organized as Trinity College, which laid solid foundations for the future. When the college moved to the growing city of Durham in 1892, it was able to find increased support both from the church and from individuals who were dedicated to the aims of liberal education. During the next three decades Trinity College drew to its faculty men of imagination, courage, and intellectual achievement who, in an atmosphere of academic freedom, created a notable liberal arts college.

The transition from college to university dates from James B. Duke's Indenture of Trust in 1924, through which Duke University came into being. The core of the new University was already in existence. This was Trinity College, which was joined in the ensuing years by three other undergraduate colleges, the Woman's College in 1925, the College of Engineering in 1939, and the School of Nursing in 1953. In the meantime, a number of professional schools were established as part of the total University structure. In hardly more than a generation Duke University was to attain a position of educational leadership and importance, both regionally and nationally, one of the remarkable stories in American higher education.

The undergraduate colleges exist as important parts of the University which, by modern standards, is moderate in size: they enroll about 4000 students in the total population of about 6500. Though they share the same campuses with the professional schools and many of the same facilities, and participate in the wide range of activities and educational advantages possible in a university environment, each of the colleges has its separate identity; yet each is related to the others and to the University as a whole.

From college to university the basic principles have remained constant. The University motto, *Eruditio et Religio*, reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation, and the church. Through changing generations of students the objective has been to encourage each individual to achieve to the extent of his capacities an understanding and appreciation of the world in which he lives, his relationship to it, his opportunities, and his responsibilities.

The undergraduate colleges of Duke University are concerned with developing the whole person. In classrooms, libraries, laboratories, gymnasia and sports fields, and in the Chapel and religious program, they are concerned with his growth and well being in all aspects of life: mental, moral, physical, social, and spiritual. Although the University has always been closely associated with the Methodist Church, it welcomes students of all faiths and encourages them to develop their spiritual lives in accordance with the tenets of their own creeds. The need of training for specialized professions and employments is recognized, but such training is incidental to a larger purpose. Through the variety of the subject matter, the insistence on a common core of fundamental courses, and an emphasis on a more intensive study of some selected subject, the colleges seek to give their students a knowledge and appreciation of world culture and at the same time provide a foundation for careers.

Location

Duke University is situated in Durham, North Carolina, a city of about 80,000 population, 250 miles southwest of Washington, D.C., and 400 miles northeast of Atlanta, Georgia. From Washington, New York, and New England it may be reached by trains of the Seaboard Railroad into Raleigh and by frequent buses from there to Durham, or by air travel via Eastern, Piedmont and United Air Lines. From the south and southwest both train and air services are available and frequent. From the Ohio Valley and the middle west frequent direct air travel is available

via Eastern Air Lines from Chicago, Detroit, Cleveland, and via Piedmont Airlines from Cincinnati and Louisville. By motor, Durham may be easily and pleasantly reached by a varied network of Federal and state highways, chiefly U. S. 15, 501, and 70, and Interstate Highway 85.

The West Campus is located on a tract of nearly 8,000 acres of rolling, wooded land on the southwest fringe of the city. The East Campus is about a mile distant, within the city, on its own campus of 110 acres. The University is an active participant in the nearby important and expanding Research Triangle of North Carolina.

The Faculty

It is the policy of the University to secure and to maintain a faculty of high competence in both teaching ability and research activity. In times of such rapid and far-reaching changes as we live in, teachers must ever be aware of new ideas, new climates of thought, new discoveries, whether they be in the sciences, in literature, or in philosophy. Their interest in the capacity for original investigation and their contribution to the ever-developing body of human knowledge help to bring to life the materials which they teach and to communicate to the college student both the excitement and the essential significance and value of learning. This double function of the scholar-teacher tends to ensure the broadest and deepest experience available to students. All ranks in the instructional staff are assigned to the beginning as well as to advanced students.

Beyond the physical limit of the classroom many opportunities exist for those students who wish and can utilize, for their own educational purposes, informal and friendly relationships with faculty members. These may be established through the regular advisory system, through extracurricular informal discussion groups and through identity of interests.

The Student Body

In establishing his educational trust in 1924, Mr. Duke requested that "great care and discrimination be exercised in ad-

mitting as students only those whose previous record shows a character, determination, and application evincing a wholesome and real ambition for life." Within the spirit of this request the admissions officers seek those students whose records and aptitudes promise a successful college experience and "who evince a wholesome and real ambition for life." Although its physical setting is in the Southeast, about half of the student body come from other sections of the nation and from foreign countries.

The University actively seeks to enroll students from a variety of different backgrounds and experiences, students possessing some special talent evolving from a passion for learning, and students who are concerned with and about the issues of today and tomorrow. Such a broadly representative group of students, chosen on merit through a selective process, ensures a cross-section of social, economic, and religious background which provides a stimulating variety in attitudes and a consequent cosmopolitan atmosphere. Such variety itself serves an important educational purpose as provincial attitudes and prejudices erode away under the mutual respect and understanding engendered by the social and intellectual interchange possible in a large, varied student body. While high scholarship always remains an important criterion in the selection of students, it is in no instance the sole measure of a student's potential success in the colleges.

Libraries and Laboratories

Since much of the educational work of a college is accomplished through books, excellent libraries become one of the most important elements in the college experience. Indeed, it may well be maintained that the library is the central, indispensable core of an educational institution. Early recognition of the need for great collections has enabled Duke to create a library of significant size and quality. The University library now ranks among the first 15 university libraries in the country, with collections totaling 1,592,000 books and over 3,000,000 manuscripts. In addition and as part of the main collection, there are numerous school and departmental libraries: the Woman's College library, situated in the center of the East Campus, contains 138,299 volumes and periodicals; the College of Engineering library,

31,847 specialized volumes; the Biology-Forestry, 80,338; Physics-Math, 26,277; Chemistry, 20,398 volumes.

As important as books are, they are not alone sufficient for a broad education in the modern world. Laboratories, equipment of all kinds, apparatus for teaching and research—these too are of great importance. Whether it be one of the Van de Graaff accelerators for work in nuclear physics, modern sensitive testing machinery for some phase of engineering, equipment for building new research devices on the frontiers of electronic experiment, digital computers for complicated mathematical formula, microphotographic apparatus for study of cell growth and decay, or the modern language laboratories for speech study and correction —all make their contributions to the complete education of the college student.

Admission

New students are admitted for the academic year at the opening of school in the fall.

The size of the entering classes is approximately as follows: Trinity College, 600; Woman's College, 350; College of Engineering, 175; the School of Nursing, 95. Since five thousand candidates normally apply and enrollment is limited, the Committee on Admissions selects those students who in its judgment are best qualified to benefit from the opportunities which the colleges offer. Selection is based not only upon academic grades and test scores but also upon recommendations of school officials and other personal criteria.

Although there are no inflexible subject matter requirements, at least fifteen acceptable units of secondary school credit must be presented. Of these at least twelve must be in college preparatory subjects: English, foreign language, history and social studies, mathematics, and physical or biological sciences. Applicants for the College of Engineering are advised to present four units of mathematics and at least one unit in physics or chemistry.

Students applying for admission are required to take the Scholastic Aptitude Test, the English Composition Test, and two other achievement tests of their own choosing given by the College Entrance Examination Board. *The Writing Sample is not considered an achievement test and will not be accepted as a substitute for any of the above mentioned tests.* Candidates applying to the College of Engineering must include the appropriate mathematics test.

While the Achievement Tests are used initially for admission, the test results may subsequently be used for course placement purposes. The student planning to continue the study of a foreign language may wish to submit the foreign language achievement test for placement purposes.

Prospective students are urged to broaden their reading outside of class during their senior year and to make the acquaintance of books and magazines that do not form part of the subject

matter of their courses. At the same time, they should take every opportunity to increase their competence in writing. Those who cannot write simple, clear, grammatical English prose will be progressively at a serious disadvantage in the competition for admission and also in the general work of the freshman year. Careful attention to correctness in English in correspondence and on application blanks cannot be too seriously stressed for candidates for admission.

Early Decision Plan

For the well-qualified student who has definitely decided to enter Duke if accepted, the University offers to reserve a place by "early decision" on December 1 of the student's senior year in secondary school. The deadline date for completing applications for early decision is November 1. Interested students should write to the Office of Admissions for detailed information.

Regular Admission

Candidates for regular admission must apply no later than January 15, and normally do so during the fall of the senior year. For this group, decisions are mailed on April 15.

Application forms and instructions regarding procedure and necessary documents to be included will be sent upon request to the Office of Admissions, Duke University, Durham, North Carolina—27706. A non-refundable processing fee of $10.00 must accompany the submission of the full application form.

Admission to Advanced Standing

Admission by transfer from other institutions may be arranged for a limited number of students, under certain well-defined regulations. All such candidates must submit official transcripts of all work completed at other colleges, accompanied by a statement of honorable dismissal, and scores on the Scholastic Aptitude Test of the College Entrance Examination Board. An overall grade average of at least C must have been earned on work previously completed; courses on which a grade less than C has been earned cannot be accepted for transfer credit. Students will not be considered for transfer beyond admission to the junior class. Further

detailed regulations for admission by transfer may be obtained from the Office of Admissions.

A small number of special students of mature age may be admitted for such courses of instruction as their earlier training and experience may qualify them to take. They may not be accepted, however, as candidates for a degree in a regular course unless they are able to meet all normal requirements for admission which apply to all beginning students.

Former students who have for various reasons withdrawn from college and who wish to continue their collegiate careers should apply to the Office of Admissions, with a detailed account of their activities since withdrawal from college.

Advanced Placement and Credit

In order to recognize superior preparation on the part of entering students the colleges have arranged for course placement on the basis of good performance on either the Advanced Placement Examinations of the CEEB or—to a more limited extent—on placement tests given by the colleges during Orientation Week. The College Board Advanced Placement Examinations are a vehicle to sophomore-level or higher placement in botany, chemistry, English, French, German, history, Latin, mathematics, physics, Spanish, and zoology, while the Duke tests are used to decide placement only in foreign languages and mathematics. A further distinction is that only the A P Examinations may lead to credit toward graduation for the course or courses omitted. Through spohomore-level placement a student is able to broaden the base of his elective courses or the depth of his study in his field of concentration in subsequent years of his college experience.

ADVANCED PLACEMENT COURSE CREDIT: Any student who has earned a score of 3 or higher on an Advanced Placement Examination of the CEEB and is approved for placement in a sophomore-level course or above may be considered for course credit in appropriate subjects. For those presenting scores of 4 or 5 the award of credit will be made automatically upon matriculation; for those presenting scores of 3 it will be determined with the approval of the University department concerned,

no earlier than the end of the first semester. Course credit may be granted for one or two semesters in each subject area in which examination is offered in the Advanced Placement Program.

It is recognized that many secondary schools are not engaged in the Advanced Placement Program. However, any secondary school student may after adequate preparation on his own initiative apply to the College Entrance Examination Board to take one or more of the Advanced Placement Tests. Such test results may be submitted to the dean of the college and will receive the same consideration.

College Expenses

Each student going to college should analyze carefully his financial situation. In making such an analysis it should be recognized that the primary responsibility for defraying the cost of an education lies with the student and his family. The typical college student can depend upon some contribution from his family's current income, a proportionate share of family savings, and anticipated income from summer employment. The number of years of study contemplated and the number of dependent children in the family should be considered in computing the funds which will be available in a particular year.

Fees paid by the students cover only a part of the cost of their instruction and of the operations of the University. Income from endowment and contributions from the alumni, alumnae, and other public-spirited men and women meet the balance, which constitutes more than half the total cost.

Estimated Expenses for an Academic Year

Certain basic expenditures are to be considered in preparing a student's budget, such as tuition, the general fee, room and board.

Incidental expenses, clothing, and travel depend to a large extent upon the tastes and habits of the individual. It is realistic to suggest that the average Duke student will spend at least $400.00 annually for incidental items, including sundry clothing purchases and organizational dues. Travel costs and major expenditures would have to be added to these estimates.

The estimated necessary expenditures are as follows:

	Undergraduate Men		*Undergraduate Women*	
Tuition	$1,250.00*		$1,250.00*	
General Fee	187.00*		187.00*	
Room Rent	250.00*		275.00*	
Board	575.00	(Cafeteria estimate)	450.00	(Board rate)
Miscellaneous Expenses	443.00		70.00	
Books and Supplies	70.00	(Moderate estimate)	450.00*	(Moderate estimate)
Totals	$2,775.00		$2,682.00	

* Although these amounts are based upon present existing charges, they are subject to change. The prospective student should contact the Office of Admissions for more current information.

It should be noted that the General Fee is a charge which represents the total of the student health, publications, athletic, library, damage, Student Union, and other fee charges.

An initial, non-refundable registration fee of $20.00 is charged all new students. This fee as well as the required $50.00 deposit is paid upon acceptance into the University. One-half of the deposit serves as a continuing room deposit for succeeding semesters, and the other half serves as a continuing reservation deposit.

Since the undergraduate colleges are residential colleges, all students except day students living at home are required to live in the residence houses. The majority of the rooms on both campuses are double rooms occupied by two students. A limited number of single occupancy rooms are available.

Dining facilities on the West Campus include three cafeterias with multiple-choice menus, and the Oak Room, where full meals and *à la carte* items are served. On the East Campus, resident undergraduate women board in dining halls at a fixed fee of $450.00 per academic year.

Financial Aid

The colleges are interested in students of ability and ambition; the total charge should not be a deterrent to those students who are unable to defray the entire cost of their education. Assistance is made available to qualified students through awards, scholarships, loans, and grants. Scholarship and loan funds, including those provided in the National Defense Education Act of 1958, provide help for about 30% of each entering class. Part-time employment in various divisions of the University often supplements this amount for the particularly needy student, or provides modest help for the student not on scholarship or loan funds. Over one thousand undergraduate students in 1963-64 received assistance totalling about $1,350,000.

Specific awards included the following:

Thirty-one Angier B. Duke Memorial Scholarships, with a value from $200 to $2600. They are awarded to men and women on a basis of merit. Though granted for one year, they are renewable from year to year so long as the student does satisfactory work.

Four W. N. Reynolds Memorial Scholarships, ranging in value up to $2600, are awarded on merit to children of employees of the R. J. Reynolds Tobacco Company, its subsidiaries and affiliates, and to residents or natives of North Carolina. They are renewable annually on the basis of satisfactory performance.

Two Mary Duke Biddle Scholarships in Music Composition at a fixed stipend of $2500 per student are available to each entering class. They are renewable from year to year so long as the student does satisfactory work. The student wishing to apply for this award will proceed in the normal manner but be required to submit samples of his musical compositions. Eligibility is limited to students desiring to major in music.

A number of National Methodists Scholarships, valued at $500 per year, are available on a basis of demonstrated need to Methodist students who have given evidence of leadership in their local Methodist Youth Fellowship Groups.

Students preparing to enter full-time religious work are eligible to supply for Christian Vocations Scholarships on the basis of need. Students approved are required to sign a note each semester for the amount of financial assistance granted to them. These notes will be cancelled upon evidence that the student has entered full-time Christian work after graduation.

Scholarships from industry, ranging in value from $200 to $2,000, are awarded to students with excellent academic records, and are renewable for each of the years of undergraduate study.

Eleven Duke University School of Nursing Scholarships, valued at $200 to $1,200 per year for a maximum tenure of two years, are awarded to young women in the entering class.

Details of all scholarships and other financial aids may be obtained from the Office of Admissions.

Residence Houses

On the East Campus ten residence houses accommodate a student-body of somewhat over 1,100 women. Each has a standard organization, consisting of a Counselor, who is a member of the Dean's staff and who lives in the house as an adult adviser, and the student House Government committee. The latter accepts responsibility in helping provide an agreeable climate for successful dormitory life. To each house are assigned students from all four classes, about 30 places in each being reserved for freshman women.

Designed in Georgian style, the residence houses form a large part of the central quadrangle of the woman's campus. They are carefully arranged for modern dormitory living, with provision for parlors, small appointment rooms, laundry rooms, kitchenettes, and other amenities for pleasant living.

On the West Campus some 2,200 men are housed in four Quadrangles—Craven, Crowell, Few, and Kilgo, and in Wannamaker Hall. Freshmen are housed in freshman houses or in special houses with upperclassmen. In the freshman houses there are housemasters; in each cross-section and special living group there is a resident fellow. Fraternity men live in separate sections of the residence halls.

Special Living Groups

Special living groups are available for approved undergraduate men. These are designed to bring students with a broad range of interest into a congenial group. A member of the academic community who is qualified by interest and experience to serve as mentor of the group lives with them. The aim is to provide a setting that will stimulate self-government and an intellectual program to supplement each individual's effort to develop his full potential.

Right—Duke Chapel is the dominating structure of the West Campus.





Entrance to the Duke University Library, center of a complex that contains one and a half million volumes.

Above—a view of the undergraduate men's dormitory area.

Below—Front and one wing of the College of Engineering Building.





Above—The Alice M. Baldwin Auditorium on East Campus.

Below—One of the Woman's College residence houses.



The Curriculum

Undergraduates at Duke may pursue a course of study leading to one of the following degrees: Bachelor of Arts; Bachelor of Science; Bachelor of Science in Civil, Electrical or Mechanical Engineering; and Bachelor of Science in Nursing. The Bachelor of Arts degree is offered with major concentration in: accounting, art history, art design, botany, business administration, chemistry, economics, education, English, French, geology, Greek, German, health and physical education (women students only), history, Latin, mathematics, music, philosophy, physics, political science, psychology, religion, Spanish, Russian, sociology, and zoology. The Bachelor of Science degree is offered with major concentration in: botany, chemistry, geology, mathematics, physics, psychology, and zoology.

The requirements for the degree of Bachelor of Arts include a broad distribution of studies among representative fields of culture, concentration within a special field, and some work of the student's own choice. The Bachelor of Science degrees require a heavier concentration in science or professional subjects, but are designed to encourage the inclusion of a maximum of liberal studies. In either case, the Duke student has available courses of study that provide a basic breadth of learning in several disciplines and a deepening study of his chosen specialty.

The philosophy of Duke is that the primary and continuing function of university education is to assure maximum training and development of the intellectual power of the individual student. Basic to this is our faith in the power of a liberal education to provide a foundation for the cultivation of leadership in both the specialist and the generalist. The curriculum provides that the student acquire an acquaintanceship with his own heritage and develop tools with which to work. Having these, he may hopefully advance toward the discovery and development of his highest talents.

Planning for the Future

Many students enter college with definite career objectives. After a period of time, however, some discover that they have lost their early interests in favor of others that appear more congenial to their aptitudes. Other students enter with only vague notions of a future career. A liberal arts course will serve all of these students, especially in the beginning years.

The student can gain more from his undergraduate college experiences if he plans his program in such a way as to achieve certain life goals and career objectives. The University Counseling Center provides professional counseling services designed to assist the student in clarifying life goals, selecting career objectives, evaluating talents and interests, and planning programs of study which will lead to the achievement of appropriate and realistic objectives. The Center is also the authorized testing center for most national testing programs which may be required for admission to graduate or professional schools, or for qualification for graduate and professional school scholarships.

Graduate Study

Students who may look forward to entering graduate or professional schools for work leading to advanced degrees will find that a broad liberal curriculum is normally adequate background and that an excellent academic record is essential. The student should inform himself of the requirements for the particular institution which he wishes to enter so that his program can be planned accordingly.

HONORS-MASTERS PROGRAM

This program, which is made possible partly by a grant from the Ford Foundation's Fund for the Advancement of Education, aims at the recruitment and accelerated preparation of college and university teachers. Academically superior undergraduates are selected by the Honors-Masters Committee during the spring of their sophomore year. During the junior year, these pre-graduates are enrolled in Colloquium 101, 102; normally the pre-graduates will be candidates for graduation with distinction in their major departments. Emphasis is also placed on the acquisition of

reading knowledge of two satisfactory foreign languages prior to the beginning of graduate work. Summer school scholarships as well as a limited number of first-year graduate scholarships are available.

LAW

No particular course is prescribed for the pre-legal student. He will want to choose his major fields of concentration, however, from those disciplines which offer him a broad general education in various fields of thought. Among these are political science, economics, history, philosophy, sociology, psychology, and English. It is essential that the prospective lawyer be highly skilled in the use of both spoken and written English. Training in public speaking and participation in debating activities will add much to his preparation for law.

MEDICINE AND DENTISTRY

Students who look forward to courses in medicine or dentistry should seek early advice upon the necessary course of study for admission to the school of their choice. All medical schools require basic courses in chemistry, physics, zoology, and mathematics. Although it should be emphasized that the pre-medical student need not major in science, the non-science major should make certain that he include in his program those advanced courses beyond the basic level that his adviser deems essential. He will also find it advisable to take more than the minimum requirements in certain other areas.

THEOLOGY AND RELIGIOUS EDUCATION

Those students who intend to enter the ministry or to follow some other religious vocation should have a broad liberal arts background. Toward this end, they should include in their programs course work in English, literature, history, philosophy, psychology, and sociology, as well as courses in religion. A concentration in one of these fields is recommended.

ACADEMIC-PROFESSIONAL PROGRAMS

Students who wish to combine the liberal arts work with a beginning year of professional school study in their senior year

should investigate the academic-forestry and academic-law programs. The provisions enabling a senior to elect the work of the first year in a professional school of the University applies solely to eligible students in Trinity College or the Woman's College. This privilege of completing the combined course of the degree is available only if the student is admitted to the professional school at the close of his junior year. A student thus admitted registers as a senior in his college and as a first-year student in the professional school.

TEACHING

The programs in the undergraduate colleges for those who wish to teach are designed to prepare both elementary and secondary school teachers. Since certification requirements vary from state to state, early advice and counseling from the faculty of the Department of Education will be well worth while.

ACCOUNTING

Students who plan to qualify to take the Certified Public Accountant's examination have available a specialized program which requires, in addition to the normal minimum requirements for graduation, certain specific courses in economics and in accounting to be taken in a required sequence.

BUSINESS

Duke students enter business careers from a variety of academic programs. There is available a Business Administration Program which requires, in addition to the normal minimum requirements for graduation, certain courses in economics, business administration and accounting to be taken in a required sequence.

ENGINEERING

The College of Engineering offers programs of study leading to the Bachelor of Science degree in Civil, Electrical, and Mechanical Engineering. The engineering curriculum at Duke is built upon the sound basis of mathematics and the physical sciences, but the engineering student selects a number of courses in the liberal arts and is a member of a community with a liberal arts tradition.

Men and women planning to pursue an engineering pro-

gram should enroll as freshmen in the College of Engineering, although its freshman program is not unlike that of the other undergraduate colleges. Transfer into or out of engineering often can be accomplished with a minimum of difficulty before the beginning of the sophomore year. Students considering engineering as a possible career, regardless of the undergraduate college in which enrolled initially, should make it a point to select the appropriate mathematics and physics courses during the freshman year.

The ROTC

Through Naval and Air Force Reserve Officers Training Corps programs the University is cooperating with the Department of Defense in providing officers for the active and reserve forces of the nation.

There are two basic programs in the Naval ROTC through which students can qualify for Naval commissions upon graduation: one, the Regular NROTC program, provides a maximum of four years in the University largely at government expense, followed by a commission in the regular Navy or Marine Corps; the other, the Contract program, leads to a commission in the Naval Reserve or the U.S. Marine Corps Reserve.

The Regular Student. Appointments are made on the basis of an annual nationwide test and selection procedure. Students selected are appointed Midshipmen, USNR, and receive four years tuition, fees, and textbooks at government expense plus retainer pay at the rate of $600 per year. The regular midshipman may take any course leading to baccalaureate or higher degree with certain exceptions, e.g., pre-medicine and medicine, pre-theological and theological, music and art. He participates in two summer training cruises aboard ship and receives aviation and amphibious indoctrination at naval shore stations during one summer. Upon graduation he receives a commission as Ensign in the Regular Navy, or Second Lieutenant in the Regular Marine Corps. The minimum period of active commissioned service is four years for regular officers.

The Contract Student. The contract student is selected from freshmen regularly enrolled in Duke University who desire to qualify for a commission in the Naval or Marine Corps Reserve while pursuing their normal courses of study. He has the status of a civilian who has entered into a mutual contract with the Navy and is not eligible for the benefits and retainer pay received by regular midshipmen. He is paid a subsistence allowance during his last two years in the NROTC, however, amounting currently to forty dollars a month. He goes aboard ship for

one summer training cruise, normally between his junior and senior years. Upon graduation, he is commissioned in the Naval or Marine Corps Reserve and reports for active duty. Minimum period of service for both the Navy and the Marine Corps is three years.

Both Regular and Contract midshipmen are deferred from Selective Service by virtue of their commitment to serve on active duty after graduation. The Navy furnishes necessary uniforms and equipment.

THE AIR FORCE RESERVE OFFICERS TRAINING CORPS: The unit functions as a regular department of instruction known as the Department of Aerospace Studies. It selects and trains students who possess the requisite character, intelligence, desire, and sense of duty to become Air Force officers.

For enrollment in the Basic Course (freshman and sophomore years) the student must be a male citizen of the United States; be physically qualified under standards prescribed by the Air Force; be accepted by the institution as a regularly enrolled student and must meet other stated requirements.

For enrollment in the Advanced Course the student must have successfully completed either the Basic Course or the six weeks Field Training Course, or have had at least one year of honorable service in the Armed Forces of the United States; must execute a written agreement with the government to complete the Advanced Course; must be sworn into the Enlisted Reserve; and must agree to accept a commission in the United States Air Force Reserve upon graduation.

Those selected for the advanced course are furnished uniforms, texts, training equipment and are paid approximately $900 for the two years of the Advanced Course. Each advanced student will attend a summer training unit, at Government expense, normally between his junior and senior year.

Student Life

Social life within the undergraduate colleges embraces so many kinds of student relationships that only a partial impression of it can be conveyed. Students of many diverse backgrounds and experiences offer both a great variety of individuality and at the same time a desire and need for community and identification. Some of this is met by common academic requirements and experiences, yet it is fair to say that most of it is gained through extra-academic affiliations. Properly, the earliest and in some respects the strongest is the class identification. In many ways the Freshman Class is the most cohesive of the four undergraduate classes, and it is during this first year that the beginning student finds his friends and associates for his college career and makes the social affiliations which will lead him into the campus life of the coming years.

Although the campuses for men and women are geographically separated, social life and college life are essentially co-educational. Each campus has its own student government association, its own inter-social councils, its own local and individual groups. All of these meet at many points for inter-college life. Women and men jointly serve on boards and councils that are concerned more with the social side of college life than with the strictly academic.

Fraternities and sororities offer to some students benefits of a social affiliation during the years of college, but offer little of interest to many others. There are eighteen national fraternities on the West Campus: Alpha Tau Omega, Beta Theta Pi, Delta Sigma Phi, Delta Tau Delta, Kappa Alpha, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Kappa Psi, Phi Kappa Sigma, Pi Kappa Alpha, Pi Kappa Phi, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Tau Epsilon Phi, Theta Chi, and Zeta Beta Tau. All of these occupy sections in the dormitory quadrangles that include chapter and meeting rooms. No separate dining facilities are provided for fraternities; the members board in the University dining halls. About half of the total men students join fra-

ternities, and both fraternity and non-fraternity groups contain respected and prominent members of the student body. Deferred rushing has been in effect for some years, and freshmen may not be asked to join fraternity groups until the beginning of the second semester of their first year. Rules governing the conduct of fraternity affairs are made by the Inter-fraternity Council and administered by the Judicial Board of that body.

In the Woman's College thirteen national sororities have established chapters on the campus: Alpha Chi Omega, Alpha Delta Pi, Alpha Phi, Alpha Epsilon Phi, Delta Delta Delta, Delta Gamma, Kappa Alpha Theta, Kappa Delta, Kappa Kappa Gamma, Phi Mu, Pi Beta Phi, Sigma Kappa, Zeta Tau Alpha. No separate dining facilities are available to sororities; members board along with all other students in the two dining halls on the campus. Sorority affairs are under the supervision of the Woman's Pan-Hellenic Council, which serves these organizations much as the Men's Inter-fraternity Council serves the fraternities.

In addition to the purely social fraternities, numerous national honorary societies have chapters on the campus. These include groups in economics, German, classics, education, psychology, social science, mathematics, engineering, political science, Spanish, physics, French, science, and in service, forensics, leadership, scholarship, and pre-ministerial. There are also numerous local honorary orders for both men and women in scholarship, leadership, athletics, medicine, and engineering.

Religious Life

Eruditio et Religio, the motto emblazoned on the seal of the University, proclaims belief in the essential union of knowledge and religion in the educational process. The Gothic Chapel stands at the center of the campus, an inspiring symbol of the place of religion in the well-balanced life. The Chapel program encourages the cultivation of the moral and spiritual life of students.

In the University Service of Worship on Sunday morning two hundred students participate by singing in the choir; at least one hundred other students aid in special ways, as ushers, collectors, and assistants in the communion services.

Opportunities are provided through the Chapel and its related activities to translate worship into effective Christian living. Denominational, interdenominational, and interfaith loyalties are emphasized. Protestant, Roman Catholic, and Jewish students are organized in their respective groups, each having a denominational chaplain or adviser.

The University Religious Council, composed of students and faculty, promotes the interdenominational religious life in its many facets. The work of the Council and of the denominational program is under the supervision of the Chaplain to the University, who is also Director of Religious Life. He, with two Associate Directors of Religious Life and five denominational chaplains, coordinates the religious program of the campus. They also offer personal guidance and spiritual counsel to all students in matters related to their faith.

The Dean of the Chapel is a key figure in student religious life. A regular preacher to the University, he preaches in the Chapel each month. He serves as an officiating minister and participates in the planning of the University's religious program.

Additional opportunities for the enrichment of the student's religious life are offered in organ and carillon recitals, choral concerts, other special services held from time to time, and in the sermons of distinguished guest preachers from many lands who are heard in the Duke Chapel. Some students, at their own discretion, participate actively in the programs of the downtown churches of their choice.

Separate in organization, yet coordinated in aims, are the YWCA and YMCA, both active organizations whose many members are concerned both with social work in the community and in varied programs integrated with campus needs. From the Freshman Advisory Council to help new students at their first arrival on campus to arrangements for Parent's Week-Ends, from sponsoring vesper services and meditations to organizing panel discussions on topics of contemporary interest and significance, the two groups make their influence felt throughout the colleges.

Music, Speech and Dramatics

Students who have developed interests in music, either as performers or spectators, will find many opportunities to indulge

their interests. Competent musicians can find artistic groups which they may join: the symphony orchestra, the chamber orchestra, the concert band, the brass ensemble, the marching band for men. All of these organizations are professionally directed, and most are devoted to the study and performance of serious music. For those who express themselves by singing, more groups are available. The Chapel Choir, composed of two hundred men and women, and the Woman's and the Men's Glee Clubs regularly give several concerts a year. A smaller group of trained voices, the Madrigal Singers, emphasizes research for and performance of unusual ensemble music. English and Italian Madrigals, French Chansons, and contemporary compositions are performed *a cappella* in campus and city programs. A new group, The Chancel Singers, has been organized for a select group of sixty men and women for the performance of challenging music. Programs have included Bach, Brahms, Pergolesi, Gabrilli, and Franck. The varied musical programs offered by such strictly student groups are supplemented by the Chamber Arts Society, which brings to the campus the best chamber music ensembles from this country and abroad; by the Duke Artists' Series, which sponsors the appearance of symphony orchestras, chorale groups, individual artists, ballets; and by the Duke Student Union, which sponsors many free concerts and recitals and maintains a classical record library for student use.

Students who take pleasure and satisfaction in speech and dramatics will find stimulating outlets for their talents. The Debate Council provides qualified students a chance to develop analytical and logical thinking in formal and informal discussions and debates. The varsity debate team has for many years established an excellent record in intercollegiate debating, both regionally and nationally. The presence on the campus of WDBS, a very active college radio station, provides experience in production, business management, engineering, and sales. The station broadcasts for more than eighteen hours a day and enlists a large audience on both campuses.

Creative dramatic experience is well supplied by the Duke Players and Hoof 'N' Horn. For many years the Players have put on distinguished productions of classical and modern plays.

Using both arena style production in their own theatre, and proscenium style in the University auditorium, the organization presents three major plays every year, and a number of experimental plays and readings. Aspiring playwrights have a chance to see their own work produced. Indeed, all aspects of design, lighting, business management, writing, and acting are available to all undergraduates of the Colleges. Hoof 'N' Horn, a younger organization, directs its attention to an annual production of a musical comedy. Student writers, composers, arrangers, directors, designers, dancers, singers, and technicians cooperate to produce highly original and diverting shows.

Publications

On every college campus student publications provide a direct and valuable opportunity for student literary expression and become thereby an adjunct to the educational process. Both men and women undergraduates find exciting and stimulating experiences working on the numerous publications issued at Duke. All publications are under the supervision of a Board composed of representatives of students, faculty, and administration. The *Archive,* a literary magazine, publishes student creative writing in fiction, poetry, essays, reviews. Throughout a long life it has maintained a high quality of literary expression, and many of its student contributors have in their maturity justified their early literary promise. The *Chronicle,* the student newspaper—"The tower of campus thought and action"—has served for more than a half century as the forum of student opinion. Published twice a week, it is consistently rated high by national college press associations. The *Chanticleer,* the yearbook, serves as a review of the school year, and records in text and pictures the individuals, organizations, and events that have academically and socially contributed to the college experience. The *Peer,* a quarterly magazine, is devoted to collegiate life and interests and contains stories of general interest, essays, and cartoons. Another quarterly, the *DukEngineer,* appears under the auspices of the students in the College of Engineering. Semi-technical in nature, it provides articles by students on new de-

velopments in the profession, news of engineering societies and their activities, and local items of interest to engineers.

The Student Union

In addition to these, but not duplicating them, is the Student Union. Efficiently organized and directed it is dedicated to stimulate, promote, and develop the social, recreational, educational, and spiritual activities of all students. To fulfill its large purpose, the Student Union operates broad and expanding programs of many kinds. Since it is student-centered, it utilizes the talents and energy of several hundred undergraduates in affecting its programs. Housed in Flowers building, it maintains lounges, Hi-Fi record collections, game rooms and offices for student organizations. Through its many committees, the Union arranges art exhibitions, photographic displays and contests, promotes bridge clubs, arranges sings, dances, and get-togethers. It sponsors major attractions, such as plays by professional groups, distinguished speakers, and prominent musical and dance groups. Through its Educational Affairs Committee it promotes symposia on questions of general interest and importance which draw to the campus figures of national and international eminence.

Physical Education

All undergraduate students are required to engage in some type of physical education for four semesters. For men this work consists of participation in natural, practical, physical activity for at least three one-hour periods each week. The purpose is to improve body control and strength to stimulate the development of mental and physical alertness, to establish habits of regular exercise, and to give training and experience in various kinds of recreational sports which the student can enjoy during and after college.

In addition to the required work in physical education, the student may choose, on a voluntary basis, to engage in the well-developed intramural program, which embraces a dozen sports and enlists the participation of a large percentage of the men students. In a typical year more than 2,000 students on many fraternity, dormitory and organizational teams participate in

tournaments to compete for more than fifty trophies. The program is deservedly popular because it enables every student to choose the sport he most enjoys and because students themselves serve as their own managers.

The program of the Health and Physical Education Department of the Woman's College is designed to give the women students an appreciation of the value of activity for general physical well-being, skill in one or more activities which can be enjoyed as recreation during and after college, a well-developed and well-coordinated body, and a knowledge of good posture and efficient handling of the body in everyday activities. Through individual conferences following the testing program of Freshman Week, entering students are assigned to special kinds of classwork as needed, such as swimming, posture, fundamentals of movement, rhythm, or sports. One course in dance is required of all students, and swimming is required for all who are unable to pass the swimming test. During the two years of required physical education, students elect their courses from a large number of activities including individual, dual, and team sports, aquatics, conditioning exercises, and several types of dance.

The dance group, the swimming club, and the other sports clubs of the Woman's Recreational Association give opportunities for each student to take part in the types of intramural activities most interesting to her. The swimming pool, tennis courts, bowling alleys, and other athletic equipment are available to all students for use at specified times.

In order to maintain certain hygienic standards of physical education and intramural athletics, the University has made available for all students the necessary uniforms, facilities and laundry services.

Intercollegiate Athletics

The intercollegiate athletic program is controlled entirely by the University through the Athletic Council composed of seven members from the faculty, administration, and alumni groups. Representative freshman and varsity teams are trained in football, basketball, baseball, track, cross country, golf, soccer, lacrosse, swimming, tennis, and wrestling. Schedules are arranged

to include both the schools in the Atlantic Coast Conference, of which the University is a member, and others in the South, North, East, and Middle West. Football and basketball are always the most popular spectator sports. The less popular sports, however, have their devoted followers, and over the years many excellent teams have represented the school, and athletes of note have been developed.

Student Health

The Student Health Program is closely related to the Teaching Hospital of the Duke University Medical Center. This arrangement provides an unusually comprehensive service, available at all times. The cost, for regularly enrolled students, is included in the general fee paid each semester, and in the fees charged each student in the summer quarter.

The service is under the direction of the University Physician with the cooperation of the Staff. It includes hospitalization in Duke Hospital, as deemed necessary by the Hospital staff, but limited to thirty days; medical and surgical care under the supervision of a senior physician or surgeon; drugs, X-ray work, and ward nursing. Special nursing is not covered. Students pay for board while in the hospital. Refraction of eyes, treatment of teeth and of all chronic and pre-existing conditions, such as diseased tonsils, hernias, pilonidal cysts and other elective surgery, chronic skin conditions, endocrine disturbances, etc. are not included. The cost of any necessary braces and orthopaedic appliances, as well as of special nursing, must be borne by the students, and blood used for transfusions must be paid for or replaced.

If students have insurance providing hospitalization, surgical, or medical benefits, the benefits shall be applied to the cost of their medical care. Accidents or illnesses occurring during vacations or while off the campus, are not included in this service. A special commercial policy available only to regularly enrolled Duke Students furnishes complementary protection, if desired.

Advisory consultation with a psychiatrist at no expense is available to students through referral either by the Student

Health Physicians or by the Deans, but office visits for psychotherapeutic interviews cannot be included in this service.

A woman physician is in charge and a nurse in constant attendance at the Woman's College Infirmary. Women students receive ambulant care at regular office hours and patients in this Infirmary can be transferred to the Duke Hospital at any hour of the day or night. Male students receive ambulant care at the Student Health Office in the hospital during regular office hours. The emergency service and the specialist consulting services of the Hospital and Medical School are always available.

Students are given a careful physical examination upon arrival at the University. Every applicant should be re-vaccinated against smallpox within three years before admission to the University. It is urgently advised that the standard Salk vaccine routine for poliomyelitis be completed by all students and that all male undergraduates be actively immunized to tetanus by injections of toxoid.

Simple directions for procedure in reporting the student's need for medical care are contained in the Student Handbook supplied to each student upon entering.



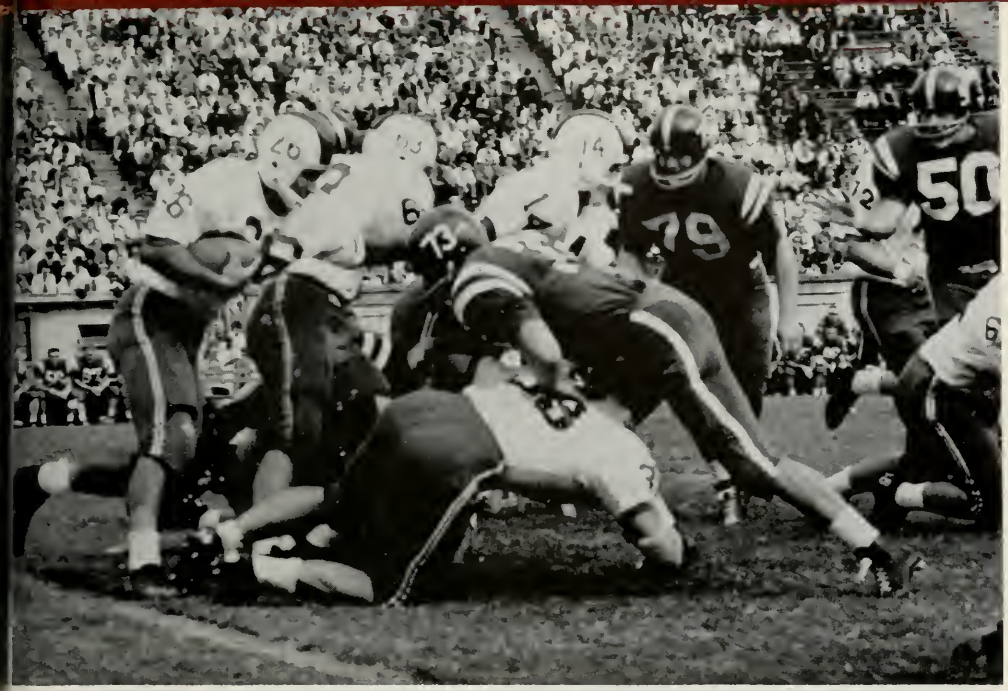
Students have an opportunity to hear lectures by distinguished scientists on the Duke faculty.



Above—After class, students gather to question their instructor concerning points in his lecture.



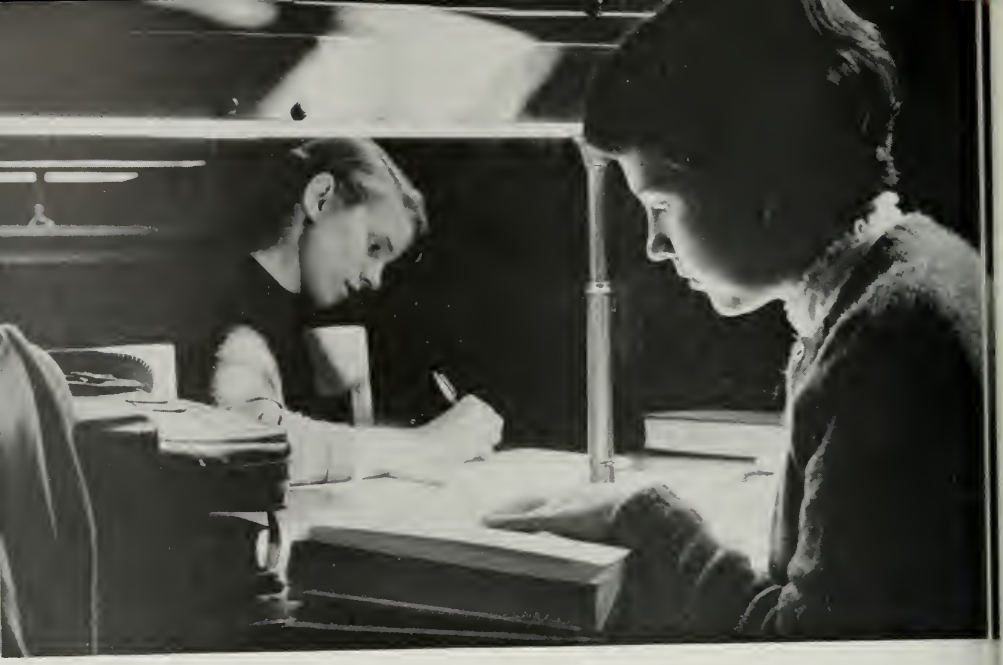
Left—In laboratories students test the theories of scientific knowledge and develop research skills.



Above—Varsity athletics give color and excitement to student life.

Below—The University offers extensive opportunities for recreation and athletic participation.





Above—A quiet and stimulating atmosphere is found in the reading and reference rooms of the libraries.

Below—Engineering students put scientific principles to work in specialized laboratories.



General Information

Class Attendance. Regular and punctual attendance in class work is expected of all students. Requirements for continuation in college and for graduation emphasize the desirability of the student assuming responsibility for class attendance.

Course Loads. The normal program for the student in Trinity College and the Woman's College is four or five academic courses, totaling 14 to 17 hours, per semester. In the College of Engineering the normal program is 17 to 19 hours per semester.

Grading System and Quality Credit. Grades in courses are recorded as A, B, C, D, F. Quality points are assigned to each grade: four quality points for A, three for B, two for C, one for D, for each semester hour. Thus an A grade in a three-semester hour course would earn twelve quality points.

Conduct. Students are expected to cooperate in maintaining high standards of conduct. The University reserves the right, and matriculation by the student is a concession of this right, to ask the withdrawal of any student whose conduct is not satisfactory to the University. Although direct supervision is entrusted to the Dean of Women and the Dean of Men, the respective men's and women's government associations exercise authority to investigate cases of misconduct and to make recommendations of penalties based on their findings.

Automobiles. Freshmen are not permitted to own or operate motor vehicles at the University. Upperclassmen are allowed to operate cars, provided they are registered and operated in accordance with University regulations. Under these conditions women in the senior class may also operate cars. A registration fee of $15.00 per semester is charged for each student-operated car.

Bus Service. Free bus transportation is provided by the University between and through the campuses.

Courses

The following list of courses open to students in the undergraduate colleges is provided to suggest the range of courses available.

Courses numbered 1-49 are normally for Freshmen; those from 50-99, for sophomores; those from 99-199, for juniors and seniors; and those from 200-299, for seniors and graduate students.

Double numbers separated by a hyphen indicate that the course is a year-course and must normally be continued throughout the year if credit is received. A student must secure written permission from the instructor in order to receive credit for either semester of a year-course. Double numbers separated by a comma indicate that although the course is a year-course credit may be received for either semester without special permission.

Aerospace Studies:

1 Leadership Laboratory
2 Defense of the U. S.
51 World Military Systems
52 Leadership Laboratory
101,102 Growth and Development of Aerospace Power
203 The Problem of Flight and Applied Air Sciences of Weather and Navigation
205,206 The Professional officer
Economics 152—Global Geography
Political Science 121—Elements of International Relations

Art:

Aesthetics

121 The Principles of Art Criticism
221-222 History of Aesthetics

History of Art

1-2 Introduction to Art History
51-52 Introduction to Art History
131 Art and Archaeology of the Hellenic World
132 Roman Art and Archaeology
133 Mediaeval Architecture
134 Mediaeval Painting and Sculpture
136 Northern Renaissance Art
137 Italian Renaissance Painting and Sculpture
140 Seventeenth Century Painting and Sculpture in Europe
141 American Art
143 The History of Prints and Drawings
144 Renaissance and Baroque Architecture
145-146 The Rise of Contemporary Architecture
147 Painting and Sculpture in the Eighteenth and Nineteenth Centuries
148 Modern Painting and Sculpture
149 Pre-Columbian Art and Archaeology
150 Latin-American Art
191,192 Independent Study
217 Aegean Art
218 Early Greek Art
233 Early Mediaeval Architecture
234 Romanesque Sculpture
239 Architecture of Britain
240 Architecture of North America
292 Research Problems (in the North Carolina Museum of Art)

Design

1L-2L Design Laboratory
51L-52L Design Laboratory
53-54 Beginning Studio
55,56 Painting
157,158 Advanced Painting
159,160 Printmaking

Botany:

1, 2 General Botany
52 Plant Identification
55 Plant Anatomy
101 Principles of Heredity
103 General Bacteriology
105 Plant Morphology

151 Introductory Plant Physiology
156 Plant Ecology
191,192 Independent Study
202 Genetics
203 Plant Cytology
209 Lichenology
210 Bryology
212 Phycology
218 Comparative Morphology of Vascular Plants
221 Introductory Mycology
225-226 Special Problems
240 Plant Evolution
252 Plant Metabolism
254 Plant Water Relations
255 Plant Systematics
256 Community Analysis and Classification
257 Principles of Plant Distribution
258 Physiology of Growth and Development
259 The Environment

Forest Botany:

253 Dendrology

Chemistry:

1, 2 General Inorganic Chemistry
41 Advanced General Chemistry
42 Introduction to Chemical Analysis
61 Fundamentals of Analytical Chemistry
70 Quantitative Analysis
132 Quantitative and Instrumental Analysis
151,152 Organic Chemistry
161,162 Physical Chemistry
191,192 Independent Study
206 Elements of Theoretical Chemistry
215 Advanced Inorganic Chemistry
216 Nuclear Chemistry
234 Chemical Instrumentation
251 Qualitative Organic Analysis
252 Advanced Organic Preparations
253 Intermediate Organic Chemistry
265 Inorganic Chemistry
271 Introduction to Research
275-276 Research

Classical Studies:

Greek

1-2 Course for Beginners
15 Mythology
63-64 Intermediate Greek
105-106 Homer, Plato
107-108 Euripides, Sophocles, and Aristophanes
117-118 Greek Prose Composition
121,122 Greek Literature in English Translation
131 History of Greece
141,142 Greek Art
151 Greek Archaeology
191,192 Independent Study

Latin

1-2 Course for Beginners
63 Cicero's Orations
91 Latin Prose
92 Latin Poetry
97 Sight Reading in Classical Latin
98 Sight Reading in Medieval Latin
101 Tacitus
102 Juvenal
103 Cicero
104 Lucretius
105-106 Latin Prose Composition
111,112 Roman Literature in English Translation
131,132 History of Rome
191,192 Independent Study
205,206 Medieval Latin
211-212 Roman Oratory

Comparative Literature:

191,192 Independent Study
201,202 Romanticism
203,204 Realism and Symbolism
205 Foundations of Twentieth-Century European Literature

For a description of the following courses see the departmental listing.
Readings in European Literature (English 153, 154)
Modern European Drama (English 155)
Religious Values in Classical and European Literature (Religion 187)

Drama: (See English)

Economics and Business Administration:

Economics

1 Introduction to Economic Problems

2 Evolution of Economic Ideas
51-52 Principles of Economics
103 Transportation
132 The Economic History of the United States
149 The Theory of the Firm
150 Economic Thought Since Adam Smith
152 Global Geography
153 Money and Banking
154 Aggregative Economics
155 Labor Problems
160 Political Economy of Europe
161 European Economic Problems
169 Economics of Consumption
189 Business and Government
201 Senior Seminar in Economics
204 Advanced Money and Banking
218 Business Cycles
219 Economic Problems of Under-Developed Areas
231 Economic History of Europe
233 State and Local Finance
237-238 Statistical Methods
243 Mathematical Economics
244 Introduction to Econometrics
257 Dynamics of the Labor Movement
262 Trade Unionism and Collective Bargaining
265 International Trade and Finance
268 Competition and Monopoly
286 Latin American Economics
287 Public Finance
293 Economic Systems
294 Economic Functions of the State

Accounting

57 Principles of Accounting I
58 Principles of Accounting II
147 Accounting for Control
171 Accounting Theory
172 Corporate Accounts
178 Accounting Systems
180 Governmentol Accounting
273,274 Auditing, Theory and Practice
275-276 Advanced Industrial Accounting and Management
277 Income Tax Accounting
278 Advanced Problems in Income Taxation
279 Budgeting and Control
295,296 Advanced Accounding Seminar-Theory and Practice

Business Administration

109 The Economic Geography of Latin America
114 Economic Geography of Africa
115 Fundamentals of Geography
120 Economic Geography of the Pacific
138 Business Statistics
143 Corporation Finance
144 Investments
181,182 Business Law
184 Commercial Law for Accountants
185 Business Administrative Organization
188 Personnel Management
190 Quantitative Methods in Business
291 Business Policy

Education:

5 Developmental Reading
68 Mental Hygiene
100 Social Foundations of American Education
101-102 Elementary Education: Principles and Practice
113 History of American Education
114 History of Education in European Culture
118 Educational Psychology
123 Language Arts in the Elementary School
142 Children's Literature
151 Public School Music Education
152 Public School Music Literature
153 Vocal Education in the Public School
161 Integrated Art in the Public School
162 Plastic Art in the Public School
201 Teaching and Supervision of Arithmetic
203 Principles of School Administration
204 The School as an Institution
210 Introduction to Educational Research
215 Secondary Education: Principles
216 Secondary Education: Internship

217 The Psychological Principles of Education
225 The Teaching of History and the Social Studies
226 Teaching Reading in the Elementary School
228 Improvement of Instruction in the Social Studies
232 Supervision of Instruction
234 Secondary-School Organization and Administration
235 The Nature, Function, and Reorganization of the Curriculum
236 Teaching Reading in the Secondary School
237 Literature for Adolescents
239 Methods of Problems of Teaching English in Secondary Schools
240 Educational and Occupational Information
241 Principles of Guidance
243 Personality Dynamics
246 The Teaching of Mathematics
253 School Law
258 Educational Measurements
266 Science in the Elementary School
276 The Teaching of High-School Science
290 Administration of School Property

Engineering: (See p. 54)

English:

1-2 Freshman Composition
53 Advanced Grammar and Writing
65-66 Imaginative Writing
93 Technical Communication
100 English for Foreign Students
101 Advanced Expository Writing
103-104 Narrative Writing

Speech and Drama

51 Essentials of Public Speaking
118 Persuasive Speaking
119 History of the Theater
121 Stagecraft
122 Play Production
139 The Speaking Voice
150 Oral Interpretation of Literature
151 Essentials of Public Speaking
152 Argumentation
171,172 Radio Broadcasting

English and American Literature and Language

55, 56 Representative British Writers
57, 58 Representative American Writers
111,112 Eighteenth-Century Literature
117 Milton
123,124 Shakespeare
125,126 English Literature, 1789-1832
127 The English Novel from the Beginnings to 1800
128 The English Novel in the Nineteenth Century
129 The English Novel in the Twentieth Century
131,132 English Literature, 1832-1900
133,134 Twentieth-Century Poetry
137,138 American Literature
141 Chaucer
142 English Literature of the Middle Ages
143,144 English Literature: Elizabethan and Seventeenth Century
147 The Literary Expression of Scientific Thought
148 Satire
150 Oral Interpretation of Literature
153,154 Readings in European Literature
155 Modern European Drama
156 Modern English and American Drama
159 Readings in Scandanavian Literature
161 Development of the English Language
162 Modern English Grammar
165,166 American Fiction
181 Conference on Drama
182 Conference on Poetry
183 Conference on Fiction
184 Conference on Prose Nonfiction or a Special Topic
191,192 Independent Study
197-198 Senior Seminar in English
203 Chaucer
207,208 History of the English Language
209 Present-Day English
213 Introduction to Folklore

215,216 Elizabethan Drama
217 Milton
218 Spenser
219,220 The Eighteenth Century
221,222 English Literature of the Early Nineteenth Century
223,224 English Literature of the Later Nineteenth Century
227 Literary Criticism
229,230 American Literature, 1800-1865
233,234 American Literature, 1865-1920
235,236 American Literature Since 1920
237 English Drama, 1642-1800
239 Shakespeare
244 Literary Biography
251,252 English Literature in the Seventeenth Century
261,262 English Literature of the Twentieth Century
264 Major Developments of Contemporary American Poetry
266 Recent Critical Thought
269,270 Southern Literature
274 American Humor
277,278 English Literature of the Sixteenth Century

Forestry:

52 Principles of Forestry

Geology:

51, 52 General Geology
57 Geomorphology
103 Fundamentals of Mineralogy
106 Igneous and Metamorphic Rocks
108 Sedimentary Rocks
143 Principles of Stratigraphy
151 Economic Geology
152 Introductory Paleontology
164 Introduction to Geologic Field Methods
166 Structure
175,176 Majors Seminar
191,192 Independent Study
203 Advanced Stratigraphy
206 Geological Oceanography
207 Sedimentary Petrography
222 Sedimentary Materials
234 Marine Geology

German:

1-2 Elementary German
63-64 Intermediate German
91,92 Introduction to German Literature
107,108 Scientific German
109-110 German Prose Fiction
115,116 German Drama of the Nineteenth Century
117,118 German Conversation
119,120 Survey of German Literature
125,126 Contemporary German Literature
131,132 Introduction to Goethe
133,134 The German Lyric
191,192 Independent Study
201,202 Goethe
203,204 Eighteenth Century
205,206 Middle High German
207,208 German Romanticism
209,210 Kleist, Grillparzer, and Hebbel
211,212 Heinrich Heine and His Time
213 Nineteenth-Century Literature
214 The Twentieth Century
215 Seventeenth-Century Literature
216 History of the German Language
218 The Teaching of German

Government: (See Political Science)

Health and Physical Education—Trinity College and The College of Engineering:

1-2 Freshman Physical Education
51 Apparatus-Tumbling
52 Badminton
53 Bosketball-Handball
56 Advanced Swimming
57 Tennis-Volleyball
58 Golf
65 History and Principles of Physical Education
132 School Health Problems
163,164 Athletic Coaching in Secondary Schools
172 Recreational Leadership
182 The Administration of Athletics in Secondary Schools
190 Protective Practices in Physical Education

Health and Physical Education—Woman's College:

1-2 Activity Courses for Freshmen

51-52 Activity Courses for Sophomores
91 First Aid and Safety in Physical Education
101 History and Principles of Physical Education
102 The Teaching of Physical Education in Elementary Schools
103 Games and Rhythms for Children
105-106 Methods and Materials in Recreation
113 Mammalian Anatomy
114 Kinesiology
117 Physical Fitness and Individual Physical Education
119 Organization and Administration of Physical Education
120 Evaluation and Measurement in Physical Education
131 Health Problems in the Twentieth Century
134 School Health
140 Gereology and Health
170 Special Health Problems
181-182 Methods and Materials in Physical Education
185 Advanced Methods and Materials in Physical Education

Hindi-Urdu:

181,182 Intensive Elementary Hindustani
183,184 Intensive Intermediate Hindustani
185,186 Advanced Hindi Reading and Composition
200,201 Special Studies in South Asian Languages

Hindi:

185,186 Advanced Hindi Reading and Composition

History:

1,2 Modern History
51,52 Modern History
51X,52X Modern History
91 The Development of American Democracy to 1865
92 The Development of American Democracy, 1865 to the Present
95,96 Ancient and Medieval History
99 Naval History and Elementary Strategy
105-106 Political and Constitutional History of England
107-108 Social and Cultural History of England
109-110 History of Rome
111,112 America in the Colonial and Early Modern Era
113,114 America in the Twentieth Century
121,122 Foreign Relations of the United States, 1775 to the Present
123,124 City and Frontier in American History
127 History of Latin America Through the Formation of the National Governments
128 Inter-American Affairs
131,132 The Development of the Major South American Powers
135,136 Europe in the Twentieth Century
137,138 Foreign Relations of the European Powers
139,140 Nineteenth-Century Europe
141,142 China and Japan in Modern Times
147 The History of India to 1757
148 The History of India, 1757 to the Present
153,154 The History of the South
157,158 The Rise of Modern Science
161,162 Russia from Ivan the Terrible to Present Times
163,164 Reform and Politics in Nineteenth Century America
191,192 Independent Study, juniors
193,194 Independent Study, seniors
201-202 History of Russia
203-204 The United States, 1850-1900
205-206 The United States in the Twentieth Century
208 Economic History of India
212 Recent Interpretations of United States History
213-214 The Old South
215-216 The Diplomatic History of the United States
221-222 The Age of the Renaissance
223-224 The Old Regime and the

French Revolution, 1661-1815
225-226 The Age of the Reformation
227-228 Europe in the Nineteenth Century
229 Recent Interpretations of Modern European History
231-232 The Hispanic Colonies and Republics in America
233-234 The Institutional, Cultural, and Social History of Hispanic America
235,236 European Expansion Overseas (1415-1898)
237-238 Europe in the Middle Ages, 395-1500
241-242 Nationalism and Communism in the Far East
245-246 War in the Modern World
247 The History of Modern India, 1757-1857
248 The History of Modern India and Pakistan, 1857-1947
249-250 Social and Intellectual History of the United States
251-252 Recent European History
259-260 The Emergence of the New South, 1865 to the Present
261-262 Russia in the Twentieth Century
263-264 American Colonial History and the Revolution, 1607-1789
267-268 England from Edward III to Anne
269 British History from 1714 to 1867
270 Great Britain and the Commonwealth of Nations, 1867 to the Present
285 Origins of Indian Civilization
297 The British Empire in the Nineteenth Century (from 1783)
298 The Commonwealth in the Twentieth Century

Undergraduate Seminars

195A-196A The Background of Modern European Civilization
195B-196B Twentieth-Century Europe
195C-196C Problems in American Intellectual History
195D-196D The Progressive Era Through the New Deal
195E-196E American History before 1789
195F-196F Problems in Nineteenth Century American Reform and Politics
195G-196G Nationalism and Communism in the Far East
195H-196H From Rural to Urban Society in the United States
195-I-196-I Nationalism and Freedom in Nineteenth Century Europe
197-198 Senior Honors Seminar

Honors-Masters Program

For a brief description of this program see page 37 of the **Bulletin of Undergraduate Instruction**

Colloquium 101,102. The University and the Scholar

Linguistics:

101 Introduction to Linguistics

For a description of the following courses consult the listings under the specifed departments.

History of the English Language (English 207, 208)
Present-Day English (English 209)
Old French Language and Literature (French 219)
Middle High German (German 205, 206)
History of the German Language (German 216)
Philosophy of Language (Philosophy 109)
Romance Linguistics (Romance Languages 224)
Cultural Anthropology (Sociology 94)
Old Spanish Language (Spanish 257)

Mathematics:

11 Algebra and Trigonometry
17 Introduction to Finite Mathematics
18 Elementary Statistics
21,22 Introductory Calculus
41,42 Introductory Calculus
63,64 Intermediate Calculus
83,84 Intermediate Calculus
111 Applied Mathematical Analysis I
112 Applied Mathematical Analysis II

113,114 Modern Algebra
131 Elementary Differential Equations
135,136 Probability and Statistics
139,140 Advanced Calculus
141,142 Junior Mathematics Seminar
183,184 Senior Mathematics Seminar
204 Geometry for Teachers
217-218 Analysis
221 Digital Computer
222 Introduction to Numerical Analysis
227,228 Theory of Numbers
229,230 Algebraic Numbers
233 Statistical Methods
234 Sample Designs
235,236 Abstract Algebra
244 Design of Experiments
247,248 Arithmetic of Polynomials
253,254 Differential Geometry
271,272 Introductory Topology
283 Probability for Engineers
285,286 Applied Mathematical Methods, I, II
287,288 Foundations of Mathematics
290 Applications of Stochastic Processes
291,292 Theory of Functions

Medical Science:

M201 Anatomy as Related to Locomotion

Music:

65-66 Music Theory I
115-116 Music Theory II
117,118 Music Theory III
121 Conducting
122 Orchestration

History and Literature

1-2 Introduction to Music
51-52 Introduction to Music
125 Masterworks of Music Literature
133 Orchestral Literature
134 Choral Literature
135 Piano Literature
136 Solo Song Literature
137 Chamber Music
138 Contemporary Music
139 The Evolution of Style in Twentieth Century Music
141 Beethoven: An Analysis of Classical System
147-148 History of Music
149 Organ Literature
163 Music in the Eighteenth Century
164 Music in the Nineteenth Century
165 Opera Literature
195,196 Collegium Musicum

Musical Education

57-58 Vocal Diction
106 Piano Methods and Materials
151 Public School Music Education
152 Public School Music Literature

Applied Music—Instrumental and Voice

Naval Science:

NS 101 Naval Orientation
NS 102 Naval History
91 Introductory Psychology
NS 202 Naval Weapons
NS 301 Naval Operations
NS 301M Evaluation of the Art of War
NS 302 Navigation
NS 302M Modern Basic Strategy and Tactics
NS 401 Naval Engineering
NS 402 Principles and Problems of Leadership

Philosophy:

41,42 Knowledge, Fact, and Value
48 Logic
93,94 History of Philosophy: Ancient and Modern
97 Political and Social Philosophy
98 Social Ideals and Utopias
101 Philosophy of Religion
103 Symbolic Logic
104 Philosophy of Science
107 Political and Social Philosophy
108 Social Ideals and Utopias
109 Philosophy of Language
110 Epistemology
111 Metaphysics
117 History of Ethics
202 Philosophy of Criticism
203 Contemporary Ethical Theories
205 The Philosophy of History
208 Political Values

211 Plato
217 Aristotle
241 Logic
246 General Semantics
250 Philosophical Analysis
252 Metaphysics
291,292 Critical Philosophy

Physics:

1-2 Introductory Physics
41-42 General Physics
125 Intermediate Physics—Mechanics
126 Intermediate Physics—Electricity
161,162 Modern Physics
171 Electronics
176 Intermediate Physics—Thermodynamics and Kinetic Theory
201,202 Mechanics
213,214 Contemporary Physics
217,218 Advanced Physics Laboratory
220 Advanced Electronics
221,222 Theoretical Physics
223,224 Electricity and Magnetism
225,226 Elementary Investigations

Political Science:

Introductory Courses

11-12 American and European Political Systems
61-62 American and European Political Systems

Political Theory and Comparative Government

123 Introduction to Political Philosophy
127 Introduction to Law
131 Introduction to American Political Thought
136 Major European Governments
143 Comparative Government and Politics: The Middle East
151 Comparative Government and Politics: Latin America
155 Problems of Political Development in the New States
160 Government of the USSR
180 Comparative Government and Politics: Southern Asia I
181 Comparative Government and Politics: Southern Asia II
182 Comparative Government and Politics: Japan
183 Comparative Government and Politics: Southeast Asia
223 Political Thought to the Seventeenth Century
224 Modern Political Theory
225,226 Comparative Government and Politics
229 Recent and Contemporary Political Theory
231 American Political Theory
235 The British Commonwealth
250 Comparative Government and Politics: Southern Asia I
251 Comparative Government and Politics: Southern Asia II
252 Comparative Government and Politics: Japan
280 Comparative Government and Politics: Sub-Saharan Africa

American Government and Public Administration

109 State and Local Government Today
125 American Political Parties and Practical Politics
128 Judicial Process
129 Groups in American Politics
137 Political Behavior in Elections
138 Political Behavior in Policy Making
141 Public Administration
142 Administrative Responsibility
146 Legislation
161 Government and Planning
164 Government Regulatory Policy and Administration
174 Political Implications of Economic Legislation
190 Public Personnel Administration
207 American Constitutional Law and Theory
208 American Constitutional Law and Current National Problems
209 Problems in State and Local Government in the United States
230 American Political Institutions
234 Civil-Military Relationships in American Government

241 Administrative Management
242 National Administration
244 Administrative Law and Process
246 Government Administration and Public Policy
275 The National Party System
276 Comparative State Parties and Politics
291 Problems of Municipal Government
292 Municipal Administration

International Law and Relations

121 Elements of International Relations
122 Modern International Politics
124 The New States of Africa in World Affairs
158 Control of American Foreign Policy
221 International Public Organization
227-228 International Law

Independent Reading and Undergraduate Seminar

191,192 Independent Study
193,194 Independent Study
197,198 Senior Seminar in Political Science

Psychology:

91 Introductory Psychology
100 Personality and Sociol Behavior
101 Introductory Social Psychology
104 Comparative Psychology
108 Introduction to Biological Psychology
110 Applied Psychology
111 Advanced General Psychology
116 Psychology of Adjustment
117 Statistical Methods in Psychology
118 Experimental Methods in Psychology
121 Child Psychology
122 Adjustment of the Pre-School Child
126 Adolescent Psychology
130 Principles and Methods of Psychological Evaluation
132 The Psychology of Individual Differences
141 Personality and Behavior Disorder
142 Instrumental Behavior
144 The Psychology of Learning
145 Experimental Approaches to Personality
147 Experimental Social Psychology
148 Psychology of Perception and Thinking
151 Psychology and International Relations
152 Physiological Psychology
153 Introduction to Biological Psychology
171,172 Junior Tutorial
173,174 Senior Tutorial
175,176 Independent Research
191,192 Independent Study and Research I
193,194 Independent Study and Research II
203 Psychology of Perception
204 Comparative Psychology
207,208 Independent Study and Research
210 Cognition and Higher Mentol Processes
213,214 Conditioning and Learning
215 Developmental Psychology
216 Biological Psychology
217 Research Methods in Sociol Psychology
218 Social Psychology
220 Physiological Bases of Behavior
225 Personality and Experimental Dynamics
229,230 Introduction to Research
233 Personality and Cognitive Processes
236 Theoretical Psychology
237 Functional Neurophysiology
238 The Electroencephalogram and Psychological Function
239 Behavioral Correlates of Brain Damage in Man
245-246 Personality Theory and Assessment
265 Fundamental Statistical Applications in Psychological Research
266 Advanced Statistical Applications in Psychological Research
292 History of Psychology

Religion:

1-2 The English Bible
51-52 The English Bible
55 The Religion of the Bible
65 Jesus: The Man and His Message
85 Introduction to Christian Ethics
93 Survey of the World's Living Religions
100 Principles of Investigation
111 The Prophets of the Old Testament
121 The Mission and Message of Jesus
123 The Life and Letters of Paul
124 The Early Church from Paul to Irenaeus
131 History of Christianity from The Early Church through the Reformation
133 History of Christianity Since the Reformation
135 Christian Biography
137 Protestantism in America
138 Contemporary Religions in the United States
140 Christian Beliefs
144 Problems of Religious Thought
149 Current Interpretations of Christianity
152 Christian Ethics
156 Christian Marriage and the Family
160 Christian Education
171 Religions of the Ancient Near East
172 Religious Quests of the Greco-Roman World
175 Non-Christian Religions of the Modern World
179 Mysticism: Sacred and Profane
187 Religious Values in Classical and European Literature
191,192 Independent Study, juniors
193,194 Independent Study, seniors
195-196 Honors Research

Senior Seminars

203 Biblical Studies
204 Church History
205 Theology and Ethics
206 Christianity and Culture
207 History of Religions
228 The Theology of the Gospel and the Epistles of John
248 The Theology of Karl Barth
260 Wesley Studies
270 The Religion of the Hindus
272 Origins of Indian Civilization

Romance Languages:

French

1-2 Elementary French
63-64 Intermediate French
91-92 Introduction to French Literature
97 Spoken French
104 The Sixteenth Century
106 The Worlds of Rousseau
107 The Worlds of Voltaire
108 French Romanticism
109 Toward Modernism in French Poetry
111 French Drama of the Nineteenth Century
112 French Drama of the Twentieth Century
113 The Classical Ideal
127,128 Advanced Composition and Conversation
134 Contemporary French Life and Thought
191,192 Independent Study, juniors
193,194 Independent Study, seniors
209 Advanced Composition and Syntax
210 French Phonetics
213,214 French Classicism
219 Old French Literature
221,222 The Nineteenth Century French Novel
227 French Poetry Since Théophile Gautier
238 Anatole France
241,242 French Literature and Thought in the Age of Enlightenment
245 French Literature of the Twentieth Century, 1895-1925
246 French Literature of the Twentieth Century 1925-1955

Italian

181-182 Italian
283 Dante: La Divina Commedia
288 The Renaissance

Portuguese

181-182 Portuguese

Spanish

1-2 Elementary Spanish
63-64 Intermediate Spanish
91-92 Introduction to Spanish Literature
97 Spoken Spanish
156 Representative Writers of Spanish American Literature
161 Spanish Literature of the Renaissance and the Baroque
162 Spanish Romanticism
164 Spanish Civilization
165 Analysis of Great Spanish Authors
176 Advanced Conversation
191,192 Independent Study, juniors
193,194 Independent Study, seniors
251 The Origins of the Spanish Novel
252 Spanish Lyric Poetry Before 1700
253 The Origins of the Spanish Theater
255 Modern Latin American Literature
256 Contemporary Latin American Literature
258 Old Spanish Literature
259 Spanish Phonetics
260 Advanced Composition and Syntax
261 Nineteenth Century Novel
264 Modern and Contemporary Spanish Theatre
265 Golden Age Literature: Cervantes
266 Golden Age Literature: The Drama
275 Contemporary Spanish Literature: Essay and Lyric Poetry
276 Contemporary Spanish Literature: Novel

Romance Languages:

RL211 Approaches to Romance Literature
RL218 The Teaching of Romance Languages
RL224 Romance Linguistics

Russian:

1-2 Elementary Russian
63-64 Intermediate Russian
91-92 Advanced Russian
97,98 Spoken Russian
101,102 Russian Literature and Culture through the Nineteenth Century
103 Soviet Literature and Culture
105 The Russian Theatre and Drama
112 Pushkin and the Birth of Russian Realism
191,192 Independent Study
201,202 The Novelists of Nineteenth Century Russia

Sociology and Anthropology:

91,92 Introduction to Sociology
93 General Anthropology
94 Cultural Anthropology
130 Culturol Change and Stability
131 Peoples of the World: American Indian
132 Peoples of the World: Africa and Oceania
133 Peoples of the World: Asia
137 Comparative Social Structures
141 Introduction to Population and Human Ecology
142 The Sociology of Mass Communication
145 Urban Sociology
146 Industry and Society
150 The Family
153 Sociology of the South
154 The Sociology of the Arts
155 Introduction to Industrial Sociology
159 The Negro in America
172 Collective Behavior and Social Movements
199 Independent Study
230 Society and Culture in India
232 Primitive Religion
234 Personality and Society
236 Personality and Culture
238 Language and Society
241 Social Stratification
242 The Sociology of Occupations and Professions

245	Deviant Social Behavior
247	Community and Society
253	Social Institutions
255	Race and Culture
272	Socialization Process
275	Social Attitudes and Individual Behavior
278	Social Structure and the Life Cycle
281	Development of Sociological Theory
295	Methodology in Sociology
296,297	Statistical Analysis in Sociology

Zoology:

1	Animal Biology
2	General Zoology
53	Comparative Vertebrate Anatomy
71	Heredity and Eugenics
92	General Embryology
103	Principles of Ecology
109	Evolution
110	Introduction to Genetics
120	Ornithology
151	Principles of Physiology
156	Vertebrate Histology
161	Animal Parasites
196	Seminar: Current Developments in Zoology
197,198	Special Problems
201	Animal Behavior
203	Ecology
210	Experimental Genetics
216	Limnology
222	Entomology
224	Vertebrate Zoology
228	Experimental Embryology
238	Systematic Zoology
243	Cytology
245	Radiation Biology
246	Molecular Biology
247	Biological Nucleonics
252	Comparative Physiology
253	Advanced Vertebrate Morphology
271	Cellular Physiology
274	Invertebrate Zoology
276	Protozoology
278	Invertebrate Embryology

COLLEGE OF ENGINEERING

Civil Engineering:

61	Plane Surveying
72	Materials Laboratory I
101	Materials Laboratory II
S110	Plane Surveying
113	Route Surveying
116	Transportation Engineering
118	Materials of Engineering
121	Hydrology
123	Hydraulic Engineering
124	Fundamentals of Sanitary Engineering
126	Sanitary Engineering Design
131	Structural Mechanics I
132	Structural Design
133	Reinforced Concrete
135	Soil Mechanics
137,138	Seminar
140	Structural Mechanics II
143,144	Project in Civil Engineering
146	Professional Engineering
148	Structural Engineering
154	Geometric Thoroughfare Design
201	Theoretical and Applied Mechanics
202	Advanced Mechanics of Materials and Experimental Stress Analysis
203	Advanced Mechanics of Materials
204	Theory of Plates and Shells
205	Theory of Elasticity
211	Behavior of Materials
231	Structural Theory and Analysis
232	Reinforced Concrete Theory
235	Foundation Engineering
242	Hydraulic Engineering
244	Sanitary Engineering Processes
250	Engineering Analysis

Electrical Engineering

53	Electrical Engineering Fundamentals
55	Electric Networks I
56	Electric Networks II
109-110	Electromagnetic Systems
111-112	Electrical Principles Laboratory
123	Fundamentals of Electrical Engineering
124	Industrial Electrical Engineering
125	Electrical Fundamentals Laboratory
126	Industrial Electrical Laboratory

127 Electronics for Engineers
159 Transmission
161 High Voltage Phenomena
165-166 Electrical Engineering Seminar
171 Fundamentals of Illumination
173-174 Projects in Electrical Engineering
177 Energy Transmission and Radiation
179 Advanced Electrical Measurements
181-182 Electronic Networks
183-184 Electronics Laboratory
189 Electromagnetic Devices
191-192 Electric Machinery
193-194 Electric Machinery Laboratory
199 Linear Feedback Systems
201 Energy Systems
203,204 Information Systems
205 Analog Computation
207 Network Synthesis
211,212 Solid State Theory
213 Magnetics
221,222 Nonlinear Electromagnetics
231 Nuclear Engineering
241 Feedback Control Systems
242 Optimum Control Systems
243 Nonlinear Control Systems
259 Advanced Electric Energy Conversion
265 Advanced Topics in Electrical Engineering

Mechanical Engineering:

52 Kinematics, Kinetics
59 Materials and Processes
101-102 Engineering Thermodynamics
103 Thermodynamics
105 Dynamics of Liquids
106 Heat Transfer
113-114 Junior Mechanical Engineering Laboratory
116 Mechanical Engineering Laboratory
128 Dynamics of Gases
141,142 Machine Design
153 Heating, Air Conditioning and Refrigeration
156 Combustion Engines
157 Pumps, Compressors and Turbines
159-160 Senior Mechanical Engineering Laboratory
162 Power Plants
163 Vibration Control
164 Engineering Analysis
166 Air Conditioning Design
167 Industrial Engineering
168 Industrial Engineering Production Methods
171 Response of Physical Systems
173-174 Mechanical Engineering Seminar
182 Fundamentals of Nuclear Engineering
197-198 Projects in Mechanical Engineering
201 Theoretical and Applied Mechanics
202 Theoretical Thermodynamics
221 Analysis of Incompressible and compressible Fluid Flow
222 Analysis of Heat Transfer
231-232 Systems Engineering
280 Nuclear Reactor Power Cycles

Engineering Subjects Common to All Curricula

1 Engineering Graphics
2 Descriptive Geometry
57 Statics
60 Engineering Mechanics
107 Mechanics of Materials
109 Mechanics of Materials Laboratory
115 Dynamics
128 Fluid Mechanics
153 Architectural Engineering
169 Legal Aspects of Engineering
170 Patent Law for Engineers

Calendar of the Colleges

1966

September 16..Friday. 7:30 p.m. Orientation begins: Assemblies for all new students entering Trinity College, the Woman's College, and the College of Engineering.

September 19..Monday. Registration and matriculation of all students of Trinity College, the Woman's College, and the College of Engineering, who have not pre-registered.

September 21..Wednesday. Final registration of pre-registered students.

September 22..Thursday. Fall semester classes begin.

November 5..Saturday. Last day for reporting six-week grades.

November 23..Wednesday. 12:30 p.m. Thanksgiving recess begins.

November 28..Monday. 8:10 a.m. Classes are resumed.

December 11..Saturday. Founders' Day.

December 20..Tuesday. 12:30 p.m. Christmas recess begins.

1967

January 3....Tuesday. 8.10 a.m. Classes are resumed.

January 14....Saturday. 12:30 p.m. Fall semester classes end.

January 17....Tuesday. Final examinations begin.

January 27....Friday. Final examinations end.

January 31....Tuesday. Registration and matriculation of new students.

February 1....Wednesday. Last day for matriculation for the Spring semester.

February 2....Thursday. Spring semester classes begin.

March 15.....Wednesday. Last day for reporting six-week grades.

March 24.....Friday. 12:30 p.m. Spring recess begins.

April 3.....Monday. 8:10 a.m. Classes are resumed.

May 18.....Thursday. 5:00 p.m. Spring semester classes end.

May 20.....Saturday. Final examinations begin.

May 31.....Wednesday. Final examinations end.

June 3.....Saturday. Commencement begins.

June 4.....Sunday. Commencement Sermon.

June 5.....Monday. Graduating Exercises.



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